BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 32.] 1935. [No. 12.

PLAGUE.

RUSSELL (A. J. H.). **Plague in India.**—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 2. pp. 725–733.

WU LIEN-TEH. **Pestilence and Plague in China.**—*Ibid.* pp. 735–759. With 1 map.

WU (C. Y.). **The Occurrence, Distribution and Seasonal Prevalence of Rat-Fleas in China (with a Note on their Relation to Bubonic Plague).**—*Ibid.* pp. 761–771. With 4 charts. [15 refs.]

FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE. TRANSACTIONS NINTH CONGRESS, NANKING, CHINA, 1934. Vol. 2. pp. 773–784.—**Round Table Discussion on Plague** [PANDIT (C. G.), Chairman].

RUSSELL (A. J. H.).—This presentation of the whole subject of plague is full of important pronouncements and would almost demand that each of its successive paragraphs be summarized.

Plague has been responsible for over 12 million deaths in British India during the last 38 years but both incidence and mortality have a rapid and progressive downward trend. Percentages of the total mortality from 1898 to 1933 are 50, 35, 13, and 2 for the periods 1898–1908, 1909–1918, 1919–28 and 1929–1933. Over these 38 years there appears to have been also a rapid and progressive immunization of the rat population and in view of this occurrence "it is difficult to estimate the part played by the usual sanitary measures in reduction of the disease." The comparative immunity of certain of the Indian provinces or even, as in the case of Assam, its entire immunity in spite of the presence of a susceptible rat population would seem to point to other circumstances. These may perhaps be found in other biological factors, "influences acting to the detriment of the flea carrier." Bengal is a province which has gradually lost its infection. [It would be interesting to know whether there exists in that province, as may be the case throughout the ports of the world, a subliminal infection in the rat population insufficient to reproduce either epizootic or epidemic.] "The comparative freedom of the whole eastern seaboard of India, of northern Burma, Assam, Bengal, the S.E. parts of Bihar and Orissa and the Western areas of the Punjab and Upper Sind" is a remarkable epidemiological phenomenon. Climatic factors are undoubtedly potent in their effect on the seasonal subsidence of

plague and may probably be summarized in the statement that " saturation deficiency is a measure of the drying capacity of the air, a high degree of which is inimical to the life of fleas. The decline of plague everywhere in India during the hot season is therefore due to high temperatures and saturation deficiencies." Forecasts of probable plague incidence are now successfully made on this basis.

The statistical figures of the value of anti-plague vaccine in India have now reached commanding proportions and Russell considers that the published tables of results provide " comparable and reliable figures for inoculated and uninoculated groups of populations " : he quotes TAYLOR's estimate that plague prophylactic vaccine " gives roughly a four-fold protection against attack and an eight-fold protection against death." [The populations compared, however, are not of the strictly " alternate case " type and may have presented some selection : the experience in the Netherlands Indies does not seem to have been so favourable.]

Research work on plague in British India is very vigorously pursued. Confirmation of the statement that greater value is to be attributed to *Past. pestis* grown at 37°C. than at 27°C. has not been forthcoming. Anti-bacterial sera are having increased attention, and among these especially plague serum. The method of standardization of such serum aims at " the measurement of the minimum amount of a given serum that would protect more than half of the animals inoculated against a measured amount of test dose of plague given at the same time as the serum but separately from it." A plague serum has been tried out with, so far, promising results : " 100 cases treated with 32 deaths (32 per cent.) and 77 controls with 53 deaths (69 per cent.). . . . As far as possible every alternate admission to the infectious diseases hospital was given serum."

The perpetuation of epizootics or enzootics is a very important plague study. " Definite evidence of smouldering epizootics all the year round has been found in some of the larger villages." These are probably due to the " persistence of infection in rat-fleas which have been proved capable of carrying over plague infection for more than four weeks even under conditions of starvation." There does not, however, seem to be much evidence that wild rodents such as gerbils, moles, field mice and squirrels have played much part as off-season reservoirs. A reference to the comparatively recent studies on retention of infection in, and the climatic conditions of rat burrows is made. The successful fumigation of rat burrows with cyanogas [this *Bulletin*, Vol. 31, p. 878 and *ante*, p. 453] concludes this informative survey.

WU LIEN-TEH.—In the introduction to this address we find the statement that " plague in China being restricted at present to a few areas and showing little tendency to spread beyond these foci, its public health importance seems limited as compared with that of certain other diseases." The history of plague " seems to show that most, if not all, plague outbreaks in China can be traced back to Central Asia." Further we learn that plague " once it had become fairly entrenched in the coastal regions remained restricted to the ports . . . and did not travel any great distance inland." The author points out that this is not surprising when we consider how easily rats can be transported by ships as compared with the possibilities of slow moving inland traffic. The importance of this is referred

to later in connexion with the possible dangers of the rapid development of railway and other fast-moving vehicular traffic. It is interesting to find that the Director of the National Quarantine Service of China is emphatic in saying that plague outbreaks " were invariably preceded by and in causal connection with, epizootics among the domestic rodents " and that " excluding again the areas with tarabagan plague, *X. cheopis* may be considered as the principal, in most as the sole, vector of infection." A further support to this, the general contention, is given in the final round table conference by POLLITZER who says : " I am very sceptical as to the claim that plague in North Africa spreads without the intervention of rats. . . . The absence of rat plague is apt to be more apparent than real."

WU (C. Y.).—Although three species of fleas, *X. cheopis*, *Leptopsylla musculi* and *Ceratophyllus anisus* are found to occur in large numbers in China the main rôle in the production of human plague is accorded to *X. cheopis*. Climatic factors and seasonal incidence are both considered in their bearing on rodent fleas and some illuminating graphs are given of the simultaneous percentage seasonal distribution of rat fleas (*cheopis* and *anisus*), rat plague and human plague. The plague season in southern China coincides with the prevalence of *X. cheopis*, but in Shanghai this flea is rarely found during this season. It is otherwise, however, for China to the north where there is " a dangerous coincidence with the period comparatively suitable for the spread of plague in Shanghai." Experience has shown, nevertheless, that " the epidemics in the north spend their energy at the spot rather than tend to invade the maritime regions. As long as this state of affairs prevails, a recurrence of epidemic plague in Shanghai is unlikely."

ROUND TABLE DISCUSSION.—Most of the agenda set out for discussion were discussed shortly by those present and interesting replies were given as to researches and opinions held in the several countries.

W. F. Harvey.

TAMPI (N. Krishnan). **A Report on Plague in Peermade (Travancore State).**—*Indian Med. Gaz.* 1935. July. Vol. 70. No. 7. pp. 383–389. With 2 maps.

This report describes what appears to have been the first (1932) serious outbreak of plague in Travancore State. The district affected, Peermade, forms part of the highland division of the State and the conditions prevailing may be said to be favourable to the outbreak of plague. " Opportunities are numerous for close association between rats and man. The houses are crowded together, dark and ill-ventilated. The holes in the floor and the ceiling offer excellent shelter for rats. The coolie lines are insanitary and overcrowded and the tea bushes around the lines also offer good shelter for the rats. Every estate has one or more rice stores all teeming with rats." The prevalence of *X. cheopis* is as high as 72 per cent. on *Rattus rattus* caught in the area, a figure which " is far higher than is necessary for effective plague transmission as observed in other localities in India." The author thinks that there is serious danger of the Peermade hills becoming a permanent centre of plague infection. *W. F. H.*

KARVE (J. V.) & SUNDARARAJAN (E. R.). **Endemicity of Plague in Mysore State. Part I.**—*Indian Jl. Med. Res.* 1935. July. Vol. 23. No. 1. pp. 21–55. With 2 graphs & 2 coloured maps. [17 refs.]

This is a valuable study of plague as it has affected an important Indian State. The authors have made an extensive statistical survey and have investigated especially the questions of endemicity and the possibility that the State is the source of plague for surrounding districts. Their communication is a preliminary one and is still incomplete. *W. F. H.*

IYENGAR (M. O. T.). **The Identification of the Common Rat-Fleas of India.**—*Indian Jl. Med. Res.* 1935. Apr. Vol. 22. No. 4. pp. 675–686. With 5 plates & 11 figs.

This is a simple illustrated key intended merely to facilitate quick identification of the common genera of Indian rat fleas and the species of the more important genera. The necessary technique is described; simple characters only are used for differentiation; and the paper is illustrated by excellent photographs and drawings.

V. B. Wigglesworth.

TSURUMI (M.). L'épidémie de peste au Manchoukouo en 1933. [**Plague in Manchukuo in 1933.**]—*Bull. Office Internat. d'Hyg. Publique.* 1935. Feb. Vol. 27. No. 2. pp. 254–256.

The epidemic of plague which prevailed in Manchukuo from August 1933 to January 1934 approached in its severity that of 1920–21 and claimed approximately 1,800 victims with a calculated mortality of 1,546. Up to the present the region east of the interior of Mongolia has been regarded as the only focus of the disease, but the province of Nungan is now regarded as another. The ground squirrel has, since 1928, been regarded as the intermediate animal of transmission, but this report seems to consider the possibility of rats also being concerned in the transmission of plague to man. At least half of the cases seem to have been bubonic but there were certainly numerous cases of septicaemia without enlargement of lymph nodes. Certain cases of pneumonic plague were reported from Nungan and Tungliao. Pneumonic plague apparently may be so rapidly fatal that the septicaemic state, which usually accompanies it, has not time to develop and the heart blood proves sterile on culture. The incubation period of eight cases of bubonic plague varied from 3 to 7 days. *W. F. H.*

BULLETIN DE L'OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE. 1935. Feb. Vol. 27. No. 2. pp. 257–267. With 1 map.—Enquête sur la peste en Afrique et sur le rôle des rongeurs sauvages et domestiques dans sa propagation. La peste en Angola [JORGE (Ricardo)]. La peste dans le Kenya et l'Ouganda pendant les années 1929–1933 [KAUNTZE (W. H.)]. [**Plague in Angola, Kenya and Uganda.**]

A continuation of the report on the questionary on Plague in Africa [see this *Bulletin*, Vol. 31, p. 875].

ANGOLA.—Plague attacked Angola rather late at the beginning of 1921, making its entry by the principal port and capital of the colony, St. Paul de Loanda. The epidemics which occurred in this town and in other ports were of the usual type, that is, they followed a rat epizootic. Selvatic plague, the plague of the wild rodent, has been recorded. Especially notable was a wave of migration of gerbilles from the South African veld, proceeding at the rate of 200 miles a month and sowing plague as it went, but productive of only two cases of human plague in Angola territory. The article concludes with the proclamation on plague, issued to the natives of Angola and couched in language suitable to the mentality of those addressed :—

" Listen people of Cuanhama, Cuamoto, Humbe, Xinga, to these words of the doctors of the Portuguese Government. You have heard of a very serious sickness which has raged for the last nine months in Ondonga, Ombarantu and Ongandjera. This sickness is among the rats which are dying everywhere, in plantations, gardens, plots and houses. The sickness passes from rat to rat and from rat to man by fleas. The Portuguese Government, with the welfare of its people at heart, has not waited for the sickness to cross the frontier and kill their people. As soon as it had heard that the sickness was at hand on the frontier it sent doctors with vaccines, medicines, carriages and much money—more money than could be collected by 20 years of tax in all Bas-Cunene—so as to be ready for the sickness and prevent the terrible results which it brings. Fear the rats : the gerbilles (mah'êto), the multimammate mice (muco), the situta, the catata, etc. If you do not want to be ill keep your houses always clean, do not let rats get near food, clear away the galleries of the rat burrows in the huts and round about to a distance of 500 metres. Leave your huts as soon as you find in them a dead rat. Tell the doctor and the post-master : the post-master will let the doctors know and they will come immediately in their cars. Those houses in which plague occurs ought to be left with only one native, who should be vaccinated, to look after the sick person. Make your way to the doctor or the post-master. Oh ! people, the doctors only want to keep you well ! Pursue the rats. Protect their natural enemies : the mongoose, the wild cat, the owl, the rat snake and especially the fox. Get yourselves vaccinated. Take the advice of the doctors. Be grateful to the Portuguese Government for the care which they are taking to preserve your lives ! "

KENYA and UGANDA 1929–1933.—Plague has steadily diminished in both colonies. Much blame for the continuance of plague has been attached to the cotton industry inasmuch as the cotton grain is regarded as a food for rats. But it appears that only rats which are captured in a cotton district feed on this grain, while rats of other districts refuse it. The evidence on the connexion of the cotton industry and plague is not altogether convincing : insanitary conditions in the mills may be the real etiological factor. Destruction of rats is not favoured in either Kenya or Uganda as an effective plague measure either in town or country. Another important question which has been studied is that of the rôle of field rodents in the transmission of plague. The general opinion is that, " although in a rat epizootic some field rodents may be attacked, the majority of infected rodents belong to the species *Rattus rattus kijabius*." The plague problem of Uganda and Kenya is essentially one which is more rural than urban and depends on improvement of rural hygiene and material welfare.

As a vector of plague *Xenopsylla brasiliensis* is more important than *X. cheopis*. The latter flea infests rats of stone and brick buildings while the former is the flea of the hut.

W. F. H.

GOBERT (E.). Le rat alexandrin, commensal du paysan tunisien. [**The Alexandrine Rat a Commensal of the Tunisian Peasant.**]—*Arch. Inst. Pasteur de Tunis.* 1935. Apr. Vol. 24. No. 2. pp. 360–367. With 2 figs.

To the south and in the centre of the Regency of Tunis there has occurred between 1920 and 1931 an almost uninterrupted series of epidemic explosions of plague. The epidemics do not attack the built-up villages but are observed among the nomads or isolated peasants. It was this fact which led to the suspicion here of a connexion between the gerbil family of rodents and plague. Experiments, however, on this point have shown that this rodent, which is much the most prevalent, is much less susceptible to plague than other Tunisian rodents and shows no tendency to chronic plague. In the present investigation the fact emerges that it is *R. alexandrinus*, the domestic rat, living in close association with the Tunisian peasant, which is much more dangerous. It is the native rat, has been present for centuries, at least since the time of the Crusaders, and is the rat which has been captured almost exclusively outside the towns. The damage done by this rat is considerable. It lives not only on dates and fruits generally but also on the flower of the palm tree, which it seeks out before its emergence from the surrounding spathe. A regular poison campaign is conducted against this destructive rodent and nux vomica is used for the purpose.

W. F. H.

ESTRADE (F.). Observations relatives à la biologie de la *Xenopsylla cheopis* en Emyrne.* [**Biology of *X. cheopis* in Madagascar.**]—*Bull. Soc. Path. Exot.* 1935. Apr. 10. Vol. 28. No. 4. pp. 293–298. With 15 charts.

Experiments in Madagascar show that adults of *Xenopsylla cheopis*, among debris away from their host, survive longest at a temperature of 15°–20°C. and a relative humidity of 85–95 per cent.

The author's object was to relate the climatic conditions under which *X. cheopis* is most abundant and plague most liable to occur, with the experimental conditions under which these fleas can best survive apart from their host. The experiments were made in cement pits 80 cm. square, with debris from their normal haunts on the floor. The optimal conditions for survival were at a temperature of 15°–20°C. and a relative humidity of 85–95 per cent. Below 80 per cent. humidity at this temperature they lived only a few days. The higher the temperature the more sensitive they are to low humidity (because the saturation deficiency of the air is increased). These results, which agree very well with those obtained by LEESON (see this *Bulletin*, Vol. 29, p. 839) were confirmed by preliminary observations in nature at various altitudes in Madagascar, and they explain the seasonal incidence of plague in the Hauts-Plateaux, which is at a maximum in December and January.

V. B. Wigglesworth.

* Emyrne or Imerina appears to be that part of the plateau making up half of the island of Madagascar which lies around the capital, Antananarivo.

JAN-KERGUISTEL (A.). Répartition de la *Dynopsyllus lypusus* à Madagascar. [**Distribution of *D. lypusus* in Madagascar.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 543–544.

ROUBAUD and MEZGER [*ante*, p. 449] have reported this flea, which can carry plague in Africa, not far from Antananarivo. Out of more than 50,000 fleas collected in 13 months in the Mahaiza sector there were only 44 specimens of *D. lypusus* 32 of which were on the rat and one on man. None of this species was present among 32,000 fleas collected in the highlands. *A. G. B.*

KELLOGG (W. H.). **The Plague Situation.**—*Amer. Jl. Public Health.* 1935. Mar. Vol. 25. No. 3. pp. 319–322. [Summary appears also in *Bulletin of Hygiene.*]

After a note on the epidemiological aspects of plague the author sets out the record of plague in California since it was introduced into San Francisco about 1900. Two bubonic epidemics have been recorded, in 1900–04 and in 1907–8, and two small pneumonic epidemics in 1919 and 1924. In addition sporadic cases have occurred, mostly in rural districts and of squirrel origin, and squirrel plague has been found in 19 counties. The probability of plague dying out the author believes is small, for where a wild native animal such as the marmot has been the rodent concerned there is no evidence that the disease has ever completely disappeared. Such an endemic, and perhaps permanent, focus now exists in the California ground squirrel. A disquieting aspect is that whereas in rat plague pneumonia is not a common finding, in squirrel plague it is common. The Oakland outbreak (1919) of 13 pneumonic cases was started by contact with squirrels, the first man having been squirrel hunting just before onset. There is the possibility of direct extension of the disease in the wild rodent population across State lines, and recently plague has been discovered among the ground squirrels of Modoc County, 400 miles from the nearest previously known plague area and close to the State lines of Oregon and Nevada. It may also travel by transference to the rats in some border-line urban area, or by means of some person incubating the disease travelling east under the climatic conditions—low temperature with considerable humidity —that, it has been suggested, favour the spread of the pneumonic form. *A. Bradford Hill.*

VOGEL (C. W.) & CADWALLADER (Charles). **Rat-Flea Survey of the Port of Philadelphia, Pa.**—*Public Health Rep.* 1935. July 26. Vol. 50. No. 30. pp. 952–957. With 1 fig.

A considerable number of vessels from plague infected ports call at Philadelphia. Many of these are not rat-proof and are laden with rat-attractive cargo. It is therefore important to take all suitable precautions to keep piers and water front in a rat-proof condition.

In the survey made the rat traps with rats, after being placed in bags, were taken to the laboratory and treated with hydrocyanic acid gas which enabled the operator readily to obtain the infesting fleas. Again, rats were chloroformed and combed for fleas over a well

illuminated white surface. All the rats were autopsied without discovering any with plague.

It was found that *X. cheopis* was essentially a rat-nest parasite and this accounted for its being found in the proximity of nests and on young rats. Altogether 2,765 rats were captured and these yielded 4,629 fleas. The main percentages according to species were :—*X. cheopis* 60, *Ceratophyllus fasciatus* 32, and *Ct. canis* (or *felis*) 2·6. Practically only one species of rat was encountered, *R. norvegicus*, and the *cheopis* index followed fairly closely the seasonal graph of relative humidity and temperature. *W. F. H.*

TRIMBLE (H. E.) & SHERRARD (G. C.). **Rat and Rat-Flea Survey of Los Angeles Harbor.**—*Public Health Rep.* 1935. Jan. 18. Vol. 50. No. 3. pp. 74–79. With 1 fig.

This survey follows the usual lines. The most prevalent flea recorded was the mouse flea *Leptopsylla musculi* and the rat flea index generally was low. " In the writer's opinion the *Xenopsylla cheopis* index is too low to sustain an epidemic of rat plague." A common finding in such surveys as these is that the rat or the flea varies with the locality of trapping. In this case the *Leptopsylla musculi* index of rats increased " almost in direct ratio as the distance from the water front." This fact is partly accounted for by association of rats with mice : the mouse, and therefore its flea, is found in the open fields, which are unprotected from the sun and wind. The increase of the mouse flea upon rats was apparent especially on the rats caught in open country. As the ground squirrel in California has been reported to suffer from plague infection, a number of these were shot. They were found to be heavily infested with *Ceratophyllus acutus*, a flea which is a vector of plague for ground squirrels. Their flea index was 18·76 and this infestation would probably suffice to maintain foci of plague infection. None of the prevalent rat fleas, however, was found upon the squirrels.

W. F. H.

LONG (John D.). **Bubonic Plague on the West Coast of South America in 1934.**—*Public Health Rep.* 1935. July 19. Vol. 50. No. 29. pp. 923–932.

Some interesting facts have emerged in the course of co-operative antiplague work in Chile, Ecuador and Peru and are recorded in this report. In the routine inoculations for plague from rats trapped in Lima and Callao twelve guineapigs died from icterohaemorrhagic jaundice or Weil's disease. When the work of trapping was commenced, a large proportion of the rats was found to be suffering from abscesses especially in the liver and lungs ; many of them, too, had helminthic infections, cysts in the liver and skin diseases. Since the rat population has been reduced through antiplague measures by about 60 to 70 per cent. in Lima and Callao, it is rare to meet with any of these conditions ; possibly this is due to less opportunity for contact. Latent plague infection is not usually discoverable through any visible lesion. In these operations such infection was usually discovered only by making mass inoculations :—Small pieces of spleen and liver, occasionally lymph node, are taken from each rat that comes to autopsy and ground up with normal salt solution. Guineapigs are inoculated with

the resultant suspension by rubbing the smeared pestle over a scarified area on the belly of the animal. Some experiments were done with guineapigs which, although they had sickened, had not died of plague. No visible lesions of plague were discoverable in these animals and yet inoculation of organs in other guineapigs produced typical bubonic plague 30 days after recovery, in one case as late as 60 days and in another 90 days after.

Lice are not commonly incriminated as reservoirs of plague, but some of the experiments would seem to indicate that head lice may become infected with plague but are not capable of transmitting the disease. Two interesting outbreaks of human plague occurred in towns high up in the Andes, to which there are no roads and where there are no rats and therefore no possibility of an antecedent rat epizootic. These outbreaks are believed to have been due to infected fleas carried in the clothing and effects of mule drivers. The sequence of events in these cases was that the drivers picked up the fleas in towns at a lower altitude, where rats are numerous and plague, both human and rodent, is present. These drivers pass the night at inns located in the towns mentioned, sleeping on the floor, and guineapigs, which are commonly kept, " snuggle up against them for warmth . . . thus affording ample opportunity for mutual interchange of fleas." The first case of human plague, the first " that had occurred in the whole province in over 3 years " was in a woman who kept guineapigs. Her sickness and death were preceded by an epizootic among the guineapigs.

In his summary the author states his belief that " fleas under favorable conditions as to temperature and humidity, especially low temperature and relatively high humidities, can act as reservoirs of plague infection, carry it over long distances and later under favorable conditions transmit the disease. The incidents cited in this article strongly indicate that head lice and guineapig fleas can also act as reservoirs of plague infection and under certain special circumstances serve as the means by which plague infection is produced."

W. F. H.

RUDNEFF (George P.) ; TINKER (J.) ; KALABUCHOV (N.). **The Life Cycle of the Ground-Squirrel (*Citellus pygmaeus* Pall.), and the Laws of Development of the Plague Epizootic. II. Changes in the Leucocyte Picture of the Ground-Squirrel Blood in the Course of their Life Cycle** [RUDNEFF].—*Rev. Microbiol., Epidémiol. et Parasit.* 1934. Vol. 13. No. 4. [In Russian pp. 291–297. [14 refs.] English summary p. 297]. **III. Changes in the Susceptibility of the Ground-Squirrels (*Citellus pygmaeus* Pall.) to the Plague in Connection with Sex and Age Differences** [TINKER & KALABUCHOV].—*Ibid.* [In Russian pp. 299–302. English summary p. 303.]

Rudneff has found that ground-squirrels during hibernation exhibit a leucopenia, with specially marked diminution of the neutrophils. To this fact he attributes the slow chronic course of plague and the maintenance of a reservoir of the plague virus in these animals during a non-epizootic period.

Tinker and Kalabuchov attempt to establish a correlation between the age and sex of ground-squirrels and their susceptibility to plague

infection. " The most susceptible are the young susliks born in the current year, then the adult females ; the least susceptible are the adult males." *W. F. H.*

WILLOUGHBY (W. M.). **Diagnostic and Other Experiences with Special Reference to Plague.**—*Jl. Roy. Nav. Med. Serv.* 1935. Apr. Vol. 21. No. 2. pp. 110–120.

Personal experiences by a former Port Medical Officer, which are related with graphic and humorous commentary, have a very special value for any one called upon to diagnose plague in the minimum of time. In the case of a ship the positive decision is very momentous for all concerned, including the Medical Officer. " A very good starting point for diagnosis of the human plague case is the finding or history of an associated dead rat." It is evident from the account given that the inspecting medical officer must likewise be alive to the possibilities of evasion of examination. The forms of the plague picture are distinctly variable and one rule to be followed is that, in the case of any one " at risk," even mild fever must be regarded as plague until the contrary is shown. Besides the actual history of the occurrence of dead rats the medical officer does well to enquire as to storekeepers. The rat, the food store and the storekeeper have, so to speak, somewhat close plague associations. Cases of plague seem to have a tendency to associate themselves with the storeroom. The storekeeper too is the man most likely to know of rat mortality on a ship. In the actual examination at " the muster " a port health officer becomes expert at picking out the man who is unwell and an expert at the detection of buboes in armpit or groin even through thick clothing and oil skins. It may also be his function to diagnose plague in the rat :—" The large spleen, marbled liver, pleurisy, peritonitis, petechiae and one or more haemorrhagic glands is a post-mortem picture of a rat dead of acute plague. More convincing still is an enlarged spleen . . . which yields the typical bipolar bacilli on film staining." One further observation may be useful to anyone in the circumstances here related. It is the resort to the flea comb for the rat with the recollection " that *Ceratophyllus fasciatus* has a very fine dog collar, denied, though not entirely, to the picture of *Xenopsylla cheopis*." *W. F. H.*

GIRARD (G.). Vaccination de l'homme contre la peste au moyen de germes vivants (virus vaccin EV). Premiers résultats acquis à Madagascar. [**First Results in Madagascar of Vaccination of Man with Living Plague (EV).**]—*Bull. Acad. Méd.* 1935. July 2. 99th Year. 3rd Ser. Vol. 114. No. 25. pp. 16–22.

An account is given by the author of the use of living plague vaccine on a large scale after it was tested on a smaller scale. In so doing he makes return to one of the original methods of PASTEUR, as it was applied to anthrax, fowl cholera and swine erysipelas. The strain of plague bacillus (EV), which is avirulent, is constantly examined for the maintenance of its characters before use in the preparation of vaccines. In a country like Madagascar the procural of satisfactory statistical data is difficult but every endeavour has been made to obtain comparable figures. These figures are :—Vaccinated (46,879)—Deaths from plague 22 (0·47 per mille) and general mortality 225 (4·8 per mille). Unvaccinated controls (60,000)—Deaths from plague 100 (1·66 per mille) and general mortality 581 (9·7 per mille). *W. F. H.*

Gohar (M. A.). **Protective Inoculation against Plague.**—*Jl. Egyptian Med. Assoc.* 1935. June. Vol. 18. No. 6. pp. 396–402. With 2 graphs.

A comparison is made between a killed (60°C., 1 hr.) vaccine, in which the endotoxin of the bacilli had been first liberated by repeated drying, grinding and resuspension, and vaccines in which the intact bacilli were killed by heat or by phenol. The experiment was carried out on guineapigs and rats and "the doses given were equivalent to 1,000, 2,000 and 5,000 million organisms injected subcutaneously in the thigh at weekly intervals." A minimum lethal dose was determined (1,000 million) for the living organism for the intraperitoneal route and the test dose was one of 8 M.L.D. Out of 48 guineapigs, divided into four groups of 12 each, one animal died in each of the batches immunized with killed intact bacilli and two in the batch of animals immunized with autolysed bacilli during the course of immunization. After injection of the test dose the animals were observed for 14 days. The results were :—survival of 2 animals out of 11 in the batch immunized with intact bacilli killed by heat, 3 out of 11 in the batch immunized with intact bacilli killed with phenol, 4 out of 10 in the batch immunized with autolysed bacilli, and none out of 12 in the control non-immunized batch. In the case of the rats the results were similar.

W. F. H.

Blanchard (M.), Blondin (P.) & Advier (M.). Septicémie pesteuse avec localisation oculaire suivie de guérison. [**Plague Septicaemia with Ocular Lesion followed by Cure.**]—*Bull. Soc. Path. Exot.* 1935. Mar. 13. Vol. 28. No. 3. pp. 235–236.

This is a description of an unusual case of septicaemic plague with unusual local lesion. Grave general symptoms were present : continuous oscillating fever, rapid pulse, profuse sweating, asthenia, torpidity, low delirium, subicterus and painful hepatic enlargement. Malaria, relapsing fever, the typhoid fevers and abscess of the liver were each eliminated. Then came ocular symptoms : conjunctival redness, intense pain, diminution of vision and double hypopyon. At this moment, on the 10th day, blood culture, which had hitherto proved negative, became positive and the organism obtained was the plague bacillus. Anti-plague serum was administered, the symptoms cleared up rapidly and the patient left hospital cured one month after admission.

W. F. H.

Pons (R.). Au sujet de l'observation de septicémie pesteuse avec localisation oculaire suivie de guérison, rapportée par MM. M. Blanchard, P. Blandin et M. Advier. [**Plague Septicaemia with Ocular Lesion followed by Cure.**]—*Bull. Soc. Path. Exot.* 1935. May 8. Vol. 28. No. 5. pp. 354–356.

A description of a case of plague was given by Blanchard, Blandin and Advier which showed a trace of jaundice, enlargement of the liver, double hypopyon, blood culture positive only on the 10th day and final recovery. It is difficult to reconcile these facts. The author has found that blood cultures obtained from guineapigs, and contaminated with bacteriophage, show four periods of development—(1) A period of apparent sterility of 36 to 48 hours, (2) a period of only a few hours

duration during which the blood culture is feebly positive but cannot be subcultured on agar, (3) a new period of apparent sterility, which may last from 4 to 20 days, and (4) a period in which a new culture arises, more abundant, capable of subculture and phage-resistant. In these facts may be found the explanation of the case in question. The delay in blood culture would be due to the intervention of bacteriophage, while the jaundice and enlargement of the liver would be due to plague endotoxin set free by lysis of bacteria caused by specific bacteriophage. *W. F. H.*

Bonne (C.). Over de pathologische anatomie der primaire longpest. [**Pathological Anatomy of Lung Plague.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. Apr. 2. Vol. 75. No. 7. pp. 564–571. With 2 figs. English summary.

Two persons escaped from observation at Bandoeng in the hill region of Java, where plague is endemic and not infrequently pneumonic; decamped to Batavia; died there before their illness was recognized and were the cause within a few days of the development of plague pneumonia in three persons with whom they had come in contact. These three persons died of what was a primary pneumonia and not the form which is secondary to bubonic plague.

At the autopsy the pneumonia in two of these persons was found to be lobar and in the third to be largely oedematous but was to all appearance not very haemorrhagic. Lymph nodes at the hilum were enlarged, but again only slightly haemorrhagic. The other organs, too, except for slight bleeding under the epicardium, in the gastric mucosa and in the adrenals, were not obviously haemorrhagic. The haemorrhagic characters of the condition were much more apparent microscopically, but the feature which was most striking was the very large number of plague bacilli in the inflamed supporting tissue of the lung. Epithelium of the small bronchi was but little affected and remained in place. The deduction is made that a primary plague pneumonia can begin with an infection in the connective tissue and not necessarily as a bronchitis. In the pneumonic exudate there was but little fibrin present. One lobe was definitely involved throughout in pneumonia of the same stage and only small pneumonic areas were present in the other lobes. A noticeable feature in these three pneumonias was the comparative absence of a polymorph leucocytic reaction, as if the patients had died of an intoxication before this had time to take place. In none of the three cases was there a typical acute infection of the spleen. *W. F. H.*

Pirie (J. H. Harvey) & Grasset (E.). **Concentrated Anti-Plague Serum.**—*Brit. Jl. Experim. Path.* 1935. Apr. Vol. 16. No. 2. pp. 126–128.

The method of concentration used was similar to that for antibacterial and other sera, a fractional precipitation process with sod. sulphate. A yield is obtained equal approximately to one-tenth of the original unconcentrated serum. Wild rats were used as test animals and the serum was inoculated intraperitoneally, while the testing dose of living plague bacilli was administered subcutaneously some time before, at the same time, or 24 hours after. One set of rats received concentrated serum, one set " ordinary " serum and one set no serum.

The minimum lethal dose of plague bacilli " was taken as the number which could be relied on regularly to kill a rat in 3 or at most 4 days." A number of the trials is set out for the exemplification of the results obtained, which went to show that the concentrated serum was four times as potent as the unconcentrated serum. *W. F. H.*

Duprat. Peste bubonique et dératisation.—*Rev. Méd. et Hyg. Trop.* 1935. Mar.–Apr. Vol. 27. No. 2. pp. 57–78.

Flu (P. C.). Immunisation des rats contre la peste au moyen de suspensions concentrées de bacilles pesteux virulents lysés par le bactériophage anti-pesteux. (2ième communication.)—*Acta Leidensia* (*Scholae Med. Tropicae*). 1934. Vol. 9. pp. 1–20.

Jorge (Ricardo). Regimento proveitoso contra ha pestenença—Lisboa, Valentim Fernandes 1496 (?).—Reprinted from *Rev. Clinica, Hig. e Hidrologia.* Lisbon. 1935. Jan. No. 1. pp. 4–7.

Kellogg (W. H.). The Plague Situation.—*Amer. Jl. Public Health.* 1935. Mar. Vol. 25. No. 3. pp. 319–322.

Scorrer (E. H.). The Deratisation of Ships.—*Jl. Roy. San. Inst.* 1935. Jan. Vol. 55. No. 7. pp. 380–387.

Seyberlich (A.) & Ranjeva (J.). De la nécessité de l'examen des crachats dans un pays où la peste est endémique.—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 541–542.

Sillevaerts (Ch.). La propagation de la peste, la dératisation et les idées nouvelles.—*Bruxelles-Méd.* 1935. June 9. Vol. 15. No. 32. pp. 880–884.

LEPROSY.

LEPROSY REVIEW. 1935. July. Vol. 6. No. 3. pp. 100–148. With 9 figs. on 4 plates. Quarterly Publication of the British Empire Leprosy Relief Association, 131 Baker Street, London, W.1. [2*s*.]

The first article in this number is on the oft described National Leprosarium of the United States by O. E. DENNEY. For approximately 500 patients 1,143,082 dollars have been spent on construction of the extensive buildings, including patients' quarters, infirmary, recreation building, school and library, administrative building, etc. The daily cost per patient is 2·39 dollars for 350 cases at present, and in fourteen years 801 patients have been admitted. This is the most completely equipped and staffed, and also the most costly, leper institution in the world.

Leprosy work in the Madras Presidency is dealt with by the medical officer in charge, J. J. JOSEPH, who points out that the leprosy survey of Dr. Santra in 1829 led to the organization of clinics for early outpatient treatment at low cost, of which there are now 400 working with yearly attendances of 903,090 in 1934 at a total cost of three lakhs of rupees (£22,500), in addition to which there are 2,100 inmates of leprosy institutions. An analysis of the results of treatment for three months and over at 107 of the clinics showed symptom free 5 per cent., greatly improved 33·5 per cent., slightly improved 40·5 per cent., leaving only 21 per cent. unimproved. A house-to-house survey in one area revealed 456 cases among 33,037 population, and the examination of 44,955 school students showed 483 cases, or 10·7 per cent. In 1930 56,000 were registered in the Province by the Public Health Department, but treatment at clinics has enabled about 120,000 to be registered. Due attention is paid to propaganda work and efforts to improve the local health conditions by visits and advice. The clinic attendances have more than doubled in two years and the treatment is becoming popular.

A comparative study of the efficacy of intradermal injections of ethyl hydnocarpate and ethyl morrhuate by G. R. RAO in a few selected cases, in which each drug was used on one side in symmetrical lesions, showed that the hydnocarpates were more effective both in reducing the lesions and the number of lepra bacilli in them, in spite of the morrhuate being the more irritant preparation ; so it is concluded that the hydnocarpates have some special effect on both the cutaneous and the nerve lesions.

Leprosy in the Leeward and Windward Islands is reported on by R. G. COCHRANE. The Leeward Islands include Dominica, Antigua, Montserrat, St. Kitts and Nevis, of which Dominica and St. Kitts have the highest incidence, the last with a rate of 0·8 per cent., and it is noteworthy that in every case of nodular leprosy whose contacts were examined one to three children were found to have become infected. The Windward Islands include St. Vincent, St. Lucia and Grenada, and few cases were found in them. Throughout this area there was a close relationship between poor economical conditions and increased incidence and activity of leprosy, St. Kitts being a marked example of such a combination. Recommendations on the usual lines are made, and the provision of a central leper institute for all these small islands is discussed, but the danger of the removal of the patients far from their

homes leading to harmful hiding of cases is considered to be strong argument in favour of local arrangements. The remaining articles are reprints from other publications. *L. Rogers.*

Montañés (P.). **Leprosy in Spain.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 197–200. With 2 figs. (1 map). Also in Spanish in *Medicina Países Cálidos.* Madrid. 1935. Sept. Vol. 8. No. 9. pp. 445–448. With 2 figs. (1 map).

In 1934 the author collected data of 928 cases of leprosy among the twenty-four million people of Spain, or nearly 0·04 per mille, but he estimated the cases at not less than 2,000, of whom 486, or barely 25 per cent., are hospitalized. The principal foci are in the Levante, Andalusia, Gallego and the Canary Islands. A recent regulation permits isolation of bacteriologically negative cases in their homes, and dread of the disease leads to notification and isolation of many cases, while open ones can be confined in leprosaria in Alicante and near Barcelona, where there is accommodation for 400 cases, which could easily be doubled, Chaulmoogra esters and hydnocarpates are used in treatment, together with local applications. Pyramidon is said to give surprising results in the control of reactions. In the last twenty-five years only 6·7 per cent. of some 893 Fontilles cases have been released as socially cured without relapse, most of those admitted having been in a very advanced stage. Better results are hoped for from treatment at venereal clinics under the recent decree, especially if early cases are sought for by epidemiological surveys, for " the efficacy of the treatment is beyond doubt." *L. R.*

Oteiza y Setién (Alberto) & Tiant y del Río (Francisco R.). El grave problema de la lepra en Cuba. [**The Problem of Leprosy in Cuba.**]—*Vida Nueva.* 1935. June 15. Vol. 35. No. 6. pp. 301–370. With 12 figs., 1 diagram & 1 chart. [56 refs.]

This is a long article, half of it digressing into questions irrelevant to the title. The numbers of deaths from leprosy are given in two tables, showing those occurring in Havana itself and those in the interior. From 1902–1916 deaths at the Rincón leprosarium are included ; the greatest number was in 1911 when 31 deaths occurred in the capital and 53 outside, or 9·5 per 100,000 inhabitants ; in 1916 the figures were only 18 and 33 or 5·2 per 100,000, the lowest since 1910. Subsequent to 1916 deaths in the leprosarium were excluded and deaths in the city have never exceeded three and in the interior 47 ; in the last two years, 1931 and 1932, there was only one each year in the town and 30 outside, a rate of 0·18 per 100,000.

In June 1932 an enquiry was started in the Dermatological Division of the Mercedes Hospital and 23 cases were detected, 18 men and 5 women ; 20 were of the nodular form, 3 of the nervous ; 19 were Cubans, 4 were foreigners. The preponderance of the nodular type is shown also in the Rincón leprosarium records, 278 out of 387.

The authors interrupt the thread of their article by a digression into the history of leprosy prophylaxis from Babylonian times and accounts of what is and has been done in other countries all over the world. They proceed to apply the knowledge to their own country and to detail the need for compulsory notification, segregation under

special conditions ; treatment ; propaganda and educational measures ; epidemiological control, the question of marriage of lepers and the care of their children, and, finally, legislative measures, the clauses of a projected enactment being detailed. These are on the usual lines and do not call for comment. *H. H. S.*

Diniz (Orestes). Notas sobre a epidemiologia da lepra familial em Minas Geraes. [**Epidemiology of Family Leprosy in Minas Geraes.**]—*Brasil-Medico.* 1935. June 15. Vol. 49. No. 24. pp. 531–534.

A list of 525 lepers registered in Colonia Santa Izabel in 1932 forms the subject of this study. Of these 207 or 39·4 per cent. attributed the infection to leprous relatives with whom they lived ; 84 or 16 per cent. habitually visited lepers living in the neighbourhood ; 19 or 3·6 shared rooms or came into close contact with cases ; 17 (3·2) vouchsafed the information that they lived near dwellings inhabited by lepers ; 4 said that they occupied houses in which lepers had previously lived ; 192 or 36·5 per cent. could give no reliable information as to the source. [These together total 523.] Attempt is made to determine the relative frequencies of infection from residence with kinsfolk, *e.g.*, from mother or father to son or daughter, uncles and aunts to nephews and nieces, brother to sister, etc., but the individual numbers of these so grouped are too small to be of much statistical value. *H. H. S.*

Pereira (Paulo Cerqueira R.). Contribuição ao estudo da reacção de Bargehr—Allergia e immunidade activa contra a lepra. [**Bargehr's Reaction and Leprosy.**]—*Brasil-Medico.* 1935. June 29. Vol. 49. No. 26. pp. 576–587. With 6 figs. [18 refs.]

Bargehr's " Lepromine " is prepared from localized lepromata by cutting them into small pieces, heating them with a little water in a waterbath for 20 minutes to obtain a paste and to this is added phenol to 0·5 per cent. It is used in the same way as tuberculin in the von Pirquet test. As a result of his investigations the author has reached the following conclusions :—

1. The lepromine reaction is negative in children up to 2–3 years of age, as they are susceptible to infection. 2. Repeated inoculations transform the negative into a positive reaction and this is proportional to the number of injections. 3. Persons harbouring the bacilli and developing the disease react positively. 4. A positive reaction is probably due to antibodies resulting from contact with Hansen's bacillus. 5. A positive reaction with absence of symptoms in a person in constant contact with lepers denotes allergy and probable immunity.

In brief the findings are analogous with those of von Pirquet in the tuberculous and others exposed to infection. *H. H. S.*

Leprosy in India. 1935. Apr. Vol. 7. No. 2. pp. 57–108. With 2 figs. & 1 plate. Issued quarterly by the Indian Council of the British Empire Leprosy Relief Association.

The prognosis in leprosy is dealt with by Dr. E. Muir in a valuable article which should be read in the original. He emphasizes the natural resistance of healthy adults, the great susceptibility of children, and the effect of small infections in producing acquired immunity.

The value of the leprolin test and the rapidity of red corpuscle sedimentation in estimating the resisting power of patients is next dealt with. He advises that the disease should have remained quiescent for two years before it is considered to be arrested and the patient watched for several years until the reaction to Hansen leprolin becomes stronger than that to Stefansky leprolin. In resistant cases the necessary period of treatment and observation is much shorter. The loss of thickening of the affected skin, reduction in the size and tenderness of nerves and in the extent of anaesthesia are favourable signs.

J. Rodriguez records results of leprosy treatment at different age periods at the children's treatment station in the Philippines with chaulmoogra preparations in bacteriologically positive cases. At the age of puberty between 13 and 17 years the results were less satisfactory than before or after, for the relapses were 58·7 per cent. at that period against 49 and 48 per cent. respectively at earlier and later ages. He also considers that relapses at or before the age of puberty are more difficult to control than at later ages.

G. R. Rao reports on the leprolin test in early cases. He finds that purely neural cases without active symptoms show a fairly strong reaction to Hansen leprolin, indicating resistance, and these may then be considered " symptom free " or " arrested cases," but if nerve cases show a stronger reaction to Stefansky than to Hansen leprolin they may be considered to be potential cutaneous bacterially positive cases. K. Bhattacherji deals with the same subject and states that a positive leprolin reaction consists in the formation of a small nodule at the site of injection after two to four weeks. The higher the resisting powers of the patient the stronger will be the Hansen reaction, and *vice versa*, so the test may be of value in regulating treatment.

The other contents of this number are of local interest, such as a successful leper day in Bihar and local reports of clinics, etc. *L. R.*

Buitelaar (L.). Lepra onder de Sa'dan-Toradja's. [**Leprosy among the Sa'dan-Toradjas.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. July 22. Vol. 75. No. 15. pp. 1211–1222. With 4 figs. on 2 plates.

In this article the author, on his own statement, does not claim to have brought forward any new facts or theories. It is simply the record of an investigation among a primitive people of the Island of Celebes. His object in making the investigation was to pave the way for setting up a leper hospital. The Toradja people, who are here concerned, number 191,000 ; their food is rice with a sufficient vitamin content, green vegetables and fish, but very little meat. Clothing and housing are of simple type, as also are the sleeping and the sanitary arrangements. The Toradja man is quite aware that infection occurs by personal contact, although he also believes in water-borne transmission. In some parts the married persons desert one another upon the onset of leprosy, but not in others. Of 185 lepers of marriageable age it was found that 77 were married, 21 unmarried, 67 separated and 20 were widows. The author discovered 204 lepers in 19 districts with a total of 163,288 inhabitants, but considers that the real total would be at least three times this number or, all over, about 3½ per mille. The age distribution of these lepers worked out at 6–15 years 2 per cent., 16–25 years 10 per cent., 26–35 years 24 per cent. and 36 years or over 64 per cent. A bacteriological examination of 115 cases of pure skin

leprosy showed that the positive percentages were, for nasal mucosa, exudative serum and thick blood drop 80, 68 and 28 respectively and that by one or other method a positive result was obtained for 101 out of the 115. An unusually high positive result was also obtained for cases of nerve leprosy—23, 12 and 5 per cent. in the examinations of nasal mucosa, exudative serum and thick blood drop respectively. The question of infection by contact was investigated in 194 persons giving the figures 35, 27 and 38 per cent. for contact with family members, strangers and no known person respectively. A still more specific enquiry furnished the unexpected result that infection was traceable in greater degree to the father than the mother of a family. In the course of his tour, which was only of the nature of survey, the author took the opportunity, as a method of propaganda, to treat all lepers with one injection of ethyl ester and a handful of chaulmoogra pills.

W. F. Harvey.

Huizenga (Lee S.). **History of Leprosy in China.**—*Reports National Quarantine Service.* Shanghai, China. 1934. Ser. 5. pp. 89–108. With 1 map. [15 refs.]

Evidence is given in this note that leprosy was probably present in China 5,000 years ago in the time of Confucius, while a good description of the disease is on record in a work of about 610 A.D.

L. R.

Wilson (R. M.). **Sterilization and Marriage of Lepers.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 201–204.

Owing to the separation of the sexes and prohibition of marriage in leper institutions many illegitimate children are born and become very liable to infection. Further, many suitable cases refuse to stay in institutions if not allowed to marry, but live a married life in camps and have many children, half of whom contract leprosy from their parents thus perpetuating the disease. To meet this very serious difficulty a self-supporting colony has been started by the author at the Korea Leper Colony under his charge by allowing couples to marry after the male partner has been sterilized by the very simple operation of vasectomy, but they are allowed to adopt a child from the colony, as the desire of Koreans to have a son is almost a religion. Help is given to enable them to build a house with land to cultivate, and at the end of a year's trial the experiment was working most successfully and the cost of maintenance of the couples was only one-fourth of the average.

L. R.

Jimenez Rivero (Miguel). La intredermoreacción a la histamina en el diagnostico precoz de las manchas leprosas. [**The Intradermal Histamine Test in the Early Diagnosis of Macular Leprosy.**]—*Gac. Med. de Caracas.* 1935. Feb. 28. Vol. 42. No. 4. pp. 55–60.

The later stages of maculo-anaesthetic leprosy are usually diagnosed without difficulty. Far otherwise may it be in the early stages, with possibly atypical lesions. The author tried the histamine method of Rodriguez and Plantilla on early cases. Histamine is a vasodilator and its action depends on this. The effects of intradermal injection of

0·1 cc. are first the production of a local erythema appearing in 15–20 seconds; then a papule, raised and oedematous, and causing localized anaesthesia in 2–3 minutes, and thirdly, if the nerve-twigs are intact, a reflex erythema at the periphery of the oedema, which recedes after a few minutes.

In macular leprosy, in a minute or so after injection a small papule with oedema appears 1–2 millimetres in diameter, and increasing to its maximum of 1 cm. in five minutes, but without itching and without any erythematous halo. This is the important feature or, more strictly, its absence constitutes the importance of the test, for in the healthy skin there develops a reddish halo 1–4 cm. in diameter in 30–60 seconds, then a papule with itching, like that following a mosquito bite, lasting for ¼–½ hour.

If the reaction is positive, *i.e.*, erythema, papule, oedema up to 1 cm. only, no itching and no red halo, the inference can be drawn that the bacilli have invaded the nerve endings, causing their degeneration, and that the macular patch is undoubtedly leprous.

The author gives brief notes of 13 cases so tested at the Asylum of Cabo Blanco. *H. H. S.*

Hoffmann (W. H.). Los gránulos intracelulares del virus de la lepra. [**Intracellular Granules in Leprosy.**]—Reprinted from *Rev. Med. y Cirug. Habana.* 1935. Vol. 39. No. 11. pp. 709–718.

A child of 11 years suffering from leprosy came under the observation of the author. In stained smears of the secretion of superficial lesions of the hand he noticed small acid fast granules in the cytoplasm of leucocytes, although he did not meet with typical forms of the lepra bacillus. These granules were less acid fast than the bacillus and the author regards them as young forms or an early stage of the typical organism which have not the acid fast property fully developed. They were all of the same size and form and not merely (so he maintains) phagocyted fragments of disintegrating bacilli, but examples of intracellular proliferation of young forms of the organisms—an intracellular phase in the evolutionary cycle of *Myco. leprae.* They are, he states, diagnostic of leprosy and are of great value in cases in which the grown organism is not found. He is of the opinion that the frequent failures at cultivation of Hansen's bacillus are ascribable to the fact that investigators have started with the adult, fully grown or degenerating forms instead of with these young, granular, developing forms. He accounts for the long latent incubation period of leprosy by suggesting that the intraleucocytic proliferation influences antibody production.

H. H. S.

Mostert (H. v. R.). **Leprosy: Some Aspects of Modern Research.**—*South African Med. Jl.* 1935. July 13. Vol. 9. No. 13. pp. 459–463. [21 refs.]

This is mainly an historical and general consideration of the leprosy problem at the present day, but contains some South African experience. Thus, he records that the probable source of infection was traced in 372 cases, of which 64 per cent. were house infective and all the remaining 36 per cent. gave a history of previous close association with a leper. The age factor is illustrated by the fact that 230 (54 per cent.) of 426 children of lepers contracted the disease, and 78 per cent. of all

infections occurred before the age of 20 ; the parents suffering from the nodular type in 59 per cent. Among 385 married lepers, 43 per cent. being nodular cases, only 33, or 8·6 per cent., gave a history of conjugal infection after marriage with a leper. Hydnocarpus preparations are advised in treatment ; trypan blue was found to be too toxic, although more effective than methylene blue or brilliant green. *L. R.*

Aragão (Henrique de Beaurepaire). Tentativas da inoculação de lepra humana em Didelphideos. [**Attempts to infect Opossums with Human Leprosy.**]—*Brasil-Medico.* 1935. Mar. 23. Vol. 49. No. 12. pp. 267–268.

This investigation was the outcome of a statement by Boyé in 1931 that he had seen in Cayenne an opossum (*Philander cancrivor* ?) an animal common in human dwellings there, with lesions resembling those of leprosy—emaciation, loss of skin in patches, and absence by amputation of terminal phalanges (see this *Bulletin*, Vol. 29, p. 270). Examination revealed enlarged glands in different parts of the body, the inguinal containing acid fast bacilli in groups of 4–8.

The authors have inoculated 55 opossums, *Didelphis aurita*, the commonest species in Rio de Janeiro, with fragments of leproma, with emulsions of leproma, or pus rich in Hansen's bacilli. Forty-seven were inoculated subcutaneously, five intraperitoneally, and one each via the pleura, the nose and into a bone. They can find no evidence of a special sensitivity of the opossum to leprosy, though the inoculated organisms persist for a long time, six months, and may perhaps show in greater number than appeared to be present in the original leproma. No difference was observed whether adults or quite young animals were employed. *H. H. S.*

Maxwell (James L.). **The Treatment of Leprosy from a Public Health Point of View.**—*Chinese Med. Jl.* 1935. Apr. Vol. 49. No. 4. pp. 313–324.

The problem of leprosy in China, with possibly a million lepers, is dealt with from the public health point of view. The resemblance of leprosy to tuberculosis in its tendency to relapse is emphasized and its unsuitability for segregation measures on account of its slight infectivity, and long incubation and course, as well as the prohibitive cost is pointed out. Moreover, preventive inoculation is not possible at present. In Kwangtung a moderate estimate places the lepers at 200,000, whose segregation would cost a capital expenditure of twenty million and an annual one of twenty-four million dollars, while compulsory measures would hinder effective leprosy work by causing hiding of cases suitable for treatment. Education methods, especially in the medical schools, are required and information to lepers of the possibility of cure. The disease is essentially a rural one, from whence many go to the cities, so it must be attacked at its source. For this purpose the author advocates village clinics on the lines of the successful outpatient work of Dr. Fraser of Swatow, where within two months of its opening 92 patients were enrolled, mostly early cases, and almost without exception improvement resulted in a short time at a cost of

not more than one dollar per month each. A nurse should follow up the cases to their homes and advise preventive measures against infection. Voluntary settlements for advanced infectious cases are also of value, but when early treatment is generally available the very existence of advanced cases will in future be looked upon as a disgrace to the medical profession. *L. R.*

Loewenstein (E.). Die Bekämpfung der Lepra auf Grund der neuesten Forschung. [**The Campaign against Leprosy.**]—*Wien. Klin. Woch.* 1935. Apr. 26. Vol. 48. No. 17. pp. 519–523.

This general account of the struggle against leprosy contains nothing new. The author estimates the world's lepers at 4,000,000. He once more emphasizes the diagnostic importance of finding lepra bacilli in the blood. *L. R.*

Sussini (Miguel), Roberto Paso (Juan) & Puente (José J.). Organización de la lucha antileprosa en la República Argentina. [**The Leprosy Campaign in the Argentine Republic.**]—*Semana Méd.* 1935. May 9. Vol. 42. No. 19 (2156). pp. 1335–1342. With 1 map & 4 figs.

The number of lepers recorded at the National Department of Hygiene is increasing; in 1906 there were 724, in 1934, 2,959; of these 621 are in Santa Fe, 614 in Capital Federal, 339 in Corrientes, 317 in Buenos Aires and 297 in Córdoba. In short 88 per cent. of the cases are in littoral provinces, 11 in the central provinces and only about 1 per cent. in the mountainous districts. It must be borne in mind that this figure of 2,959 represents those actually known to the Health Department; there are others seen by medical men but not notified, others are under no medical care, others have been wrongly diagnosed, and the above total is therefore only indicative of the true prevalence which is very probably double or treble this.

The usual lines are laid down for dealing with the problem, according as the cases are in an early or advanced stage—the erection of dispensaries, establishment of leper colonies. Detailed general plans of such a colony are among the illustrations, others depicting a perspective view of the whole, and plans of the administration and treatment blocks. The general plan would be instructive, but unfortunately is printed too faintly for reproduction [incidentally it has been printed upside down]. That of the perspective view is good, but without the other cannot be interpreted. *H. H. S.*

Lefrou (G.) & des Essarts (J. Quérangal). Le problème de la lèpre tuberculoide: premier et second mémoires. [**Tuberculoid Leprosy.**]—*Bull. Soc. Path. Exot.* 1935. Apr. 10. Vol. 28. No. 4. pp. 301–316. [14 refs.]

This paper describes some cases of tuberculoid leprosy and discusses the condition. After referring to earlier literature the author states that cases can only be recognized by microscopical examinations showing the special giant celled structure with few or no lepra bacilli.

L. R.

WADE (H. W.). **Tuberculoid Changes in Leprosy. IV. Classification of Tuberculoid Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 121–136. With 1 fig. [26 refs.]

The difficulty in classifying the tuberculoid form of leprosy is discussed, and it is pointed out that it was not dealt with in that recommended by the Memorial Conference in Manila, as the author only met with cases in a subsequent world tour in Japan, South Africa and India. He goes on to consider Japanese objections to the Manila classification, where tuberculoid cases are classed as a type of the macular form, and in South Africa as maculo-anaesthetic. The cases are benign and favourable with negative bacteriological findings, and histologically show non-lepromatous lesions with an extraordinary degree of reaction to the very few bacilli present. It is therefore considered that they should be classed as neural in a special sub-type to be indicated by the symbol Nt. *L. R.*

HARROWER (Gordon). **Ainhum Disease and the Anaesthetic Type of Leprosy.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. June 29. Vol. 29. No. 1. pp. 73–76. With 3 figs.

The author records cases of ainhum somewhat resembling nerve leprosy. *L. R.*

LARA (C. B.) & DE VERA (B.). **Early Leprosy in Infants born of Leprous Parents ; with Report of Cases.**—*Jl. Philippine Islands Med. Assoc.* 1935. May. Vol. 15. No. 5. pp. 252–260. With 4 plates.

Five cases of very early lesions in the children of lepers are described. In ten consecutive such cases seen at Culion in seven years a leprotic papule was observed in seven at ages between 15 months to $5\frac{1}{2}$ years, and in the other three a reddish slightly raised macule was first noted, all being positive bacteriologically. In five of the ten cases two to six lesions were found simultaneously, but not grouped together. The papules were from the size of a pin's head to 2 to 3 millimetres in diameter, slightly flattened and fairly sharply defined. These early lesions tended to subside spontaneously, but resolved somewhat more rapidly under antileprotic treatment. Photos of some of the cases are published. *L. R.*

RIBEIRO (Léonidio). La lèpre est capable d'altérer les dessins papillaires des empreintes digitales. [**Changes in Finger Prints due to Leprosy.**]—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 195–196. With 8 figs. on 2 plates.

Illustrations are reproduced to demonstrate that leprous lesions are able to produce complete alterations in the finger-prints of patients whose prints were available before their illness. Microscopical examinations showed that the changes were not due to atrophy, but to active lepromatous infiltration with the presence of lepra bacilli.

L. R.

Itakura (Teiju). Zahnärztliche Untersuchungen bei Leprakranken. II. Bericht: Klinische Untersuchungen ueber Pyorrhoea alveolaris bei leprakranken Formosachinesen (Fokien-Stamm). [**Pyorrhoea in Leprosy.**]—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. Formosa).* 1935. June. No. 6 (363). [In Japanese. pp. 827–834. German summary p. 835. 23 refs.]

This brief note records that pyorrhoea was met with in 52 per cent. of leprosy cases, and was more common in nodular than in nerve cases and in women than in men. It was also more frequent in lepers than in non-lepers. *L. R.*

Lampe (P. H. J.) & de Moor (C. E.). Ratten-lepra. [**Rat Leprosy.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1935. Apr. 16. Vol. 75. No. 8. pp. 634–654. With 7 figs. on 2 plates. English summary.

The authors report their observations on rat leprosy in the Dutch East Indies. The diagnosis must be based on bacteriological examinations of the lymph nodes, which they have done in 5,000 trapped rats with from 5 to 25 per cent. positive results in different species of rats, the highest being in *R. concolor* and *R. norvegicus*. In 185 out of 500 naturally infected rats only the glands were involved, 10 per cent. of them showing many large colonies of bacilli. Superficial skin lesions were noted in 14 animals, so they regard the disease as a latent, but progressive one. The geographical distribution shows the disease to be world-wide if carefully sought for, and they suggest that what was originally a common saprophyte has secondarily adapted itself to the animal kingdom. *L. R.*

Badger (L. F.) & Sebrell (W. H.). **Leprosy. The Effect of a Vitamin B_1 Deficient Diet on the Incubation Period of Rat Leprosy.**—*Public Health Rep.* 1935. June 28. Vol. 50. No. 26. pp. 855–863.

" Four experiments have been conducted in which white rats on a vitamin B_1 deficient diet and rats on a control diet have been inoculated, subcutaneously, with rat leprosy.

" The incubation period of rat leprosy in the rats on the vitamin B_1 deficient diet was appreciably shorter than in the rats on the control diet.

" In two experiments, white rats on a vitamin B_1 deficient diet were inoculated, subcutaneously, with human leprous material. Local lesions were produced which have continued to increase in size."

L. R.

Demanez (Marie-Lucie). Recherches sur la lèpre murine et le bacille Duval 514. [**Rat Leprosy and Duval's Bacillus 514.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Mar. 31. Vol. 15. No. 1. pp. 31–37.

This paper first deals with the feeding of fish with the organs of rat leprosy with negative results as regards inducing infection of the fish, although acid-fast bacilli were found in the intestines one month after. Next, leprosy rats were infested with lice, and after the death of the rat healthy ones were placed in the jar, but although lice were found on them they did not become infected with rat leprosy. Other experiments confirmed previous work showing that the injection of acetone

extracts of tubercle bacilli rendered rabbits temporarily susceptible to rat leprosy. Lastly, the acid-fast bacillus of Duval 514 was found not to become infective to rabbits injected with acetone extracts of tubercle bacilli. *L. R.*

PRUDHOMME (R. O.). Résistance des bacilles de Stéfansky aux rayons ultra-violets. [**Resistance of Stefansky's Bacillus to Ultra-Violet Rays.**]—*C. R. Soc. Biol.* 1935. Vol. 119. No. 27. pp. 1328–1330.

The action of ultra-violet rays in destroying the vitality of Stefansky's rat leprosy bacillus has been tested, and irradiation by a vapour mercury lamp at a distance of 20 cm. for not less than two minutes was found to render them harmless on injection into rats. *L. R.*

OHTAWARA (T.); KAWAMURA (M.); ICHIHARA (Tsuruo). Studium der Lepra. II. Mitteilung: Wie reagiert der Leprakranke auf die intrakutane Injektion von Rattenleprabazillen? [OHTAWARA & KAWAMURA].—*Zent. f. Bakt.* I. Abt. Orig. 1935. July 23. Vol. 134. No. 5/6. pp. 312–315. III. Mitteilung: Das Verhalten der Geschlechtsdrusen den Rattenlepra-bazillen gegenueber. [**Bacilli of Rat Leprosy.**] [OHTAWARA & ICHIHARA].—*Ibid.* pp. 316–318.

These workers have studied the occurrence of rat leprosy bacilli in the genital glands, and they found in rats with skin leprosy lesions these glands to be infected in 40 per cent. of males and 45 per cent. of female animals, and when the lymph glands were involved by the disease the male sexual glands were bacteriologically positive in 75 per cent. and the female glands in 26 per cent. These data show less frequent involvement in rat than in human leprosy. *L. R.*

WALKER (Ernest Linwood) & SWEENEY (Marion S.). **Cultivation of Facultative Acid-fast Bacteria from Filtrates of Rat Leprosy and of Human Leprosy.**—*Jl. Infect. Dis.* 1935. Mar.–Apr. Vol. 56. No. 2. pp. 97–100. [11 refs.]

After a brief account of earlier literature on the cultivation of acid-fast bacilli from filtrates of human and rat leprous material the authors record their own experiments. Using emulsions of human leprous material passed through a Berkefeld N candle, they obtained one positive culture of acid-fast bacilli out of two, and with similar rat leprosy material passed through Sitz, Berkefeld N and W, and Chamberland L_2 and L_3 filters at a pressure of about 20 cm. of mercury positive results were got in 17 out of 52 tests. They do not, however, consider that these results support the claims of Markianos and others of the existence of an "ultravirus" stage of the leprosy organism, for they had previously demonstrated that a few acid-fact bacilli may pass through such filters even when control tests show that *Chr. prodigiosum* is retained by them. They consider these results support their view that Hansen's bacillus may be a tissue stage of the several types of pleomorphic and facultative acid-fast bacteria that have been repeatedly cultivated from human leprosy. *L. R.*

WATANABE (Yoshimasa). **Experimental Studies on Animals concerning Leprosy. Report II. Inoculation Tests with Human Leprosy (Part I).**—*Kitasato Arch. Experim. Med.* 1935. Apr. Vol. 12. No. 2. pp. 139–153.

Experimental inoculations of rats with human leprous tissue are recorded. Subcutaneous inoculations were followed by cellular and connective tissue formation, with some giant cells and acid-fast bacteria, but no lepra cells, but the nodules healed and the bacilli disappeared in 71 to 400 days. Intravenous inoculations produced no nodules or other changes. Eye inoculations produced only temporary inflammation and nodule formation without any leprose changes. The degree of reaction is in proportion to the amount of material injected. *L. R.*

HISAMOCHI (Y.). **Early Tissue Reactions in the Lungs of Rabbits after Intravenous Injections of Acid-fast Bacilli. Part 5. Experiments with Dr. Ota's So-called Acid-fast Bacilli of Human Lepra.**—*Jl. Oriental Med.* 1935. May. Vol. 22. No. 5. [In Japanese. English summary pp. 69–70.]

The early tissue reactions of the lung to intravenous injections of human lepra bacilli is reported on, Ota's so-called acid-fast bacilli of leprosy being used. After phagocytosis of the bacilli monocytes formed a tubercle with considerable thickening of the alveolar septa. After seven days the bacilli could not be obtained and after a month the tubercle was no longer recognizable. *L. R.*

MANALANG (C.). **The Pathogenesis, Etiology, Transmission and Epidemiology of Leprosy.**—Reprinted from *Rev. Filipina de Med. y Farmacia.* 1935. July. Vol. 26. No. 7. pp. 265–268.

In this note the author once more states his hypothesis that leprosy is caused by an invisible virus which later develops into acid-fast bacilli.

L. R.

VAUDREMER (A.) & BRUN (C.). La culture du bacille de Hansen. [**Cultivation of Hansen's Bacillus.**]—*Bull. Acad. Méd.* 1935. June 25. 99th Year. 3rd Ser. Vol. 113. No. 24. pp. 905–914.

Seven years' work on the cultivation of the lepra bacillus is recorded. Media employed in cultivating the tubercle bacillus were used, with the addition of filtrates through Chamberland L3 bougies of cultures of *Aspergillus fumigatus*. Either dissected out sterile leproma or the blood of leper patients taken during a febrile attack were employed. Lepromas taken during such a febrile reaction gave positive cultures in four cases, but three taken during quiescence of the disease were negative. A piece of the spleen from a post-mortem on a leper 30 hours after death was also used. After 15 to 30 days a Gram-positive pseudomeningococcus appeared in the cultures, but it produced no signs of meningitis on intraspinal injection in rabbits, so it is regarded as a stage in the development of Hansen's bacillus, for it was succeeded by a stage of fine granular cyanophilic bacilli, and later by innumerable acid-fast bacilli, which in one case appeared as early as the third day,

although in the case of fragments of spleen it took five months to reach this stage. The present cultures vary in age from 10 months to four and a half years. The presence of glycerine is necessary to produce acid-fast bacilli. Endospores are described and are considered to be a resisting stage of the organism. Animal experiments with the cultures showed that they develop through the Gram-positive cyanophilic to an acid-fast stage in the blood of rats and in the spleen and mesenteric glands of monkeys. Agglutination of the organism was obtained with sera from three lepers, a slight reaction with a tuberculous case and negative results with those of seven controls. Further, the serum of lepers alone produced lysis of the cultures. *L. R.*

Yuyama (Hiroyoshi). Ueber die histologische Untersuchung der Glykogenverteilung in der leprösen Haut, mit besonderer Berücksichtigung der Beziehung zwischen der Funktion der Schweissdrüsen und der Schwankung des Glykogens. [**Glycogen Researches.**]—*Japanese Jl. Dermat. & Urol.* 1935. June. Vol. 37. No. 6. [In Japanese pp. 811–886. With 4 coloured figs. on 2 plates. [69 refs.] German summary pp. 134–136.]

The author reports his histological researches on glycogen destruction in the skin of leprosy patients with special reference to the sweat glands. When the function of the sweat glands is increased the glycogen decreases in them, and he has investigated the amount of glycogen destruction in various stages of 103 leprosy patients. In the maculo-anaesthetic form in all stages he found no glycogen in the epidermis except in the prickle cells, and also none in the lepra cells and other leprous parts. In nodular cases he found similar deficiency of glycogen, and in the nerve and leucodermic forms he found none in either the epidermis or other parts, including the sweat glands. *L. R.*

Pooman (A.). Ueber die Blutlipase bei Leprösen. [**The Blood Lipase in Lepers.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Feb. Vol. 39. No. 2. pp. 70–74. [20 refs.]

The author concludes from his observations that the blood lipase is diminished in leprosy, but increases when the condition of the patient improves and decreases when the patient gets worse. Remedies that are effective against leprosy increase the blood lipase, estimations of which are valuable in controlling the results of methods of treatment.

L. R.

Lomholt (Svend) & Engelbreth-Holm (J.). Bemerkungen zum Aufsatz P. Parmakson : Ueber die eosinophilen Zellen im Blutbilde der Leprakranken (Dermat. Wschr. 1935, Nr. 10, S. 285). [**Eosinophile Count in Leprosy.**]—*Dermat. Woch.* 1935. May 11. Vol. 100. No. 19. pp. 541–542.

This brief note records that intravenous injections of antileprol were followed by a considerable rise of the eosinophile blood corpuscles to 64 per cent., but intramuscular injections only produced inconstant and weak eosinophile reactions. *L. R.*

Bier (Otto G.) & Arnold (Käte). Ueber die Serologie der Lepra. I. Die Spezifität und Sensibilität der Rubino-Reaktion Untersuchungen ueber den Mechanismus der Reaktion. II. Komplementbindung bei Lepra mit dem Tuberkulose-Antigen von Witebsky, Klingenstein und Kuhn. III. Die serologische Differentialdiagnose zwischen Syphilis und Lepra. [**Serum Reactions in Leprosy.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. June. Vol. 39. No. 6. pp. 231–236; 236–238; 238–241. [14 refs.]

The authors arrive at the following conclusions from their serological studies. I. The Rubino reaction in 327 leprosy cases gave positive results in 29·3 per cent. of pure nerve cases, in 41·7 of the maculo-anaesthetic type, in 56·5 of mixed cases, in 66·6 of nodular and in 13·8 per cent. of incipient cases. In 945 control cases only 0·1 per cent. were positive. In mixed cases the proportion of reactions increases with degree of involvement of the skin and varies from 20–42 per cent. in C_1 to 50–67 per cent. in C_3 cases.

II. Complement fixation in leprosy with the tubercle antigen of Witebsky, Klingenstein and Kuhn furnishes reactions that are of considerable diagnostic value.

III. The serological differentiation between leprosy and syphilis is dealt with in this section, and the authors conclude that leprous sera can give complement deviation with tubercle and streptothrix antigens. Complement deviation with Witebsky and Gomes antigens give with leprosy effective antigen reactions of the same kind as in tubercle.

L. R.

Soule (M. H.). **The Wassermann Reaction and the Kahn Test in Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 181–194. [22 refs.]

" The sera of 615 patients with more or less advanced cutaneous leprosy, and 54 other cases with severe lepra reaction, were tested by both the Kolmer-Wassermann and the Kahn procedures for syphilis. The group had been carefully selected, and comprised only individuals whose clinical examinations and case histories failed to reveal evidence of syphilis or yaws.

" Of the 615 sera from cases without lepra reaction the Wassermann test gave 109 strongly positive and 5 positive, a total of 18·5 per cent., as compared with 121 strongly positive and 70 positive, a total of 31 per cent. reactors with the method of Kahn.

" Of the 54 sera of patients undergoing severe lepra reaction 18 were strongly positive and 1 positive with the Wassermann test, and 18 strongly positive with the Kahn, 35·2 per cent. and 33·4 per cent., respectively.

" This study adduces considerable evidence that leprosy *per se* is responsible for the positive reactions." *L. R.*

Stein (A. A.). **Lepra Reaction and Meteorotropism.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 137–152. With 6 figs. [25 refs.]

" 1. The occurrence of exacerbation of leprous processes depends upon changes in the atmospheric conditions.

" 2. There is no relation between exacerbation and the annual or monthly temperatures, the barometric pressure, rainfall or winds.

" 3. Exacerbations occur in a region with the passage of ' variable layers ' of different systems (cyclones, anticyclones, etc.).

" 4. The greatest number of exacerbations (73 per cent. of my cases) occurred during the passage of cyclones and occluded cyclones.

" 5. The greatest number of exacerbations were observed during the passage of the warm front of cyclones (44 per cent.), and next the cold front (29 per cent.).

" 6. In cold seasons exacerbations prevail when the warm front sets in, and to the contrary in the warm season when the cold front passes.

" 7. Multiple cases of exacerbation are more numerous and appear more frequently in winter.

" 8. In stable weather only a small number of cases of exacerbation was observed (7 per cent.) ; they appeared only as isolated cases.

" 9. The exacerbations of leprous processes appear not only on the day the variable layer passes, but also on the previous day." *L. R.*

Lagrosa (M.) & Ignacio (J.). **Observations on Some Effects of Intradermal Injection of Certain Esters of Different Degrees of Saturation.**—*Jl. Philippine Islands Med. Assoc.* 1935. Apr. Vol. 15. No. 4. pp. 220–222.

Intradermal injections were made in thirty selected cases with symmetrical lesions using moderately unsaturated *Hydnocarpus wightiana* esters, highly unsaturated cod-liver oil esters, slightly unsaturated olive oil esters and practically unsaturated ethyl stearate. Observations were continued for a year with clinical and bacteriological examinations at from one to two months' intervals. The results showed no definite relationship between the degree of unsaturation and the results, for with the hydnocarpus and cod-liver oil preparations all showed clinical improvement, with the olive-oil esters 72·8 per cent. improved and with ethyl stearate 80 per cent., while only 40 to 45 per cent. of control uninjected areas clinically improved. Bacteriologically the hydnocarpus esters showed most improvement, with ethyl stearate a close second, cod-liver oil a fair third, and very little advantage from the olive oil preparation as compared with the controls. Further evidence is thus furnished of the superiority of the Hydnocarpus preparations.

L. R.

Lagroso (M.), Tiong (J. O.) & Disini (D.). **Further Observations on the Course of the Anesthesia following Antileprotic Intradermal Injections.**—*Jl. Philippine Islands Med. Assoc.* 1935. June. Vol. 15. No. 6. pp. 312–318.

The authors confirm their previous experience of the beneficial effects of intradermal injections of iodized *Hydnocarpus wightiana* esters on the anaesthesia of leprosy. There was relatively greater proportionate improvement in treated than in control areas in twenty-five patients with symmetrical lesions, who were also given intramuscular injections of the drug, after eight months treatment followed by suspension for two or three months ; 88 per cent. of the treated improved against 52 per cent. of the control areas. Injections of ethyl oleate and normal saline showed 75 per cent. improved against 41 per cent.

of controls ; this is attributed to the mild trauma and irritation produced. A combination of subcutaneous, intramuscular and intradermal injection is advised. *L. R.*

KEIL (Ernst). Zur Behandlung der Lepra mit Jod-Antileprol. [**Treatment of Leprosy by Iodized Antileprol.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. May. Vol. 39. No. 5. pp. 188–199. With 6 figs. [14 refs.]

The author deals with treatment by the iodized chaulmoogra esters first introduced by COLE in the Philippines, but he advocates the addition to the esters of 10 per cent. instead of ½ per cent. iodine, and gives from ½ to 3 cc. once or twice weekly, largely by the intradermal method. He warns that a rise of temperature or congestive dermal reactions are contraindications for continued treatment. Of 273 cases 110 were treated for over one year and 163 for over two years, and 20 per cent. were cutaneous, 57 neural and 23 per cent. mixed cases ; 21 per cent. were early, and 75 per cent. more advanced. The results were that 13 per cent. became negative bacteriologically, 44 showed clear improvement, 41 were stationary and 2 per cent. became worse. *L. R.*

GRIMES (Ch.), CLUZET & MINEC. Note préliminaire sur un essai de traitement de la lèpre à Madagascar par *le violet de gentiane.* [**Treatment of Leprosy with Gentian Violet.**]—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 415–416.

The authors report a trial of intravenous injections of 3 mgm. per kilo of gentian violet in 1 per cent. solution intravenously twice a week without any toxic symptoms. In 35 cases a series of 24 injections produced effects on the nerve symptoms in the form of healing of ulcers, diminution of paralysis of the hand muscles and of erythematous and depigmented patches, and of anaesthesia. It is too early to say if the effects will be lasting. *L. R.*

DELANOË (E.). Le bleu de méthylène compris dans le traitement mixte de la lèpre. [**Methylene-Blue in Leprosy.**]—*Bull. Soc. Path. Exot.* 1935. May 8. Vol. 28. No. 5. pp. 348–353.

Two cases are recorded treated by injections of methylene blue. The staining of the leprous lesions is regarded as a valuable diagnostic aid in the case of hyperplastic lesions only, but the vitality of the lepra bacilli does not seem to have been impaired. M. MARCHOUX pointed out that the six injections used would not suffice to test the value of the dye. *L. R.*

FERNANDEZ (José M. M.) & SCHUJMAN (Salomón). El empleo de las anilinas en el tratamiento de la reaccion leprosa. [**Aniline Dyes in the Treatment of the Leprous Reaction.**]—*Rev. Leprologia de São Paulo.* 1935. June. Vol. 2. No. 2. pp. 79–85.

MUIR and CHATTERJI have recommended the use of mercurochrome in cases with leprous reaction, and the authors have tested this, and fluorescin and eosin for the same condition.

Mercurochrome contains between 20 and 25 per cent. metallic mercury and also a certain proportion of fluorescin. It has been employed

as an antiseptic for a considerable time and in leprosy Muir and Chatterji attribute a threefold action to it, (1) on concomitant sepsis, (2) on the allergic state, the leprous reaction, and (3) provoking necrosis and resolution of lepromata. The authors used a 1 per cent. solution in fresh distilled water, giving 3 cc. intravenously and 3–4 days later 5–8 cc. and thereafter 10 cc. weekly according to the degree of tolerance and the results obtained. Signs of intolerance are stomatitis, gastro-intestinal disturbance, rise of temperature and sometimes shivering immediately following the first injection, but as a rule the drug is well tolerated. Of 16 patients so treated, 6 were greatly benefited, 4 partially, in 3 the result was doubtful, and in 3 its use failed altogether.

Fluorescin was used in doses of 10 cc. intravenously every 4 days, the strength of solution being 2 per cent. freshly prepared, filtered and sterilized. Eleven patients so treated showed perfect tolerance, but in 3 only who presented iritis or acute ocular symptoms of the leprous reaction did it succeed and in them the improvement was immediate.

The authors used eosin in a 2 per cent. strength in distilled water, 10 cc. intravenously every 4 days. Seven patients were treated but though none showed any signs of intolerance none received any benefit from it. *H. H. S.*

Tisseuil (J.). Essai de traitement de tuberculoïde de la lèpre par la crisalbine. [**Treatment of Tuberculoid Leprosy with Crisalbine.**]—*Bull. Soc. Path. Exot.* 1935. May 8. Vol. 28. No. 5. pp. 346–348. With 2 figs.

The author reports that although others have been unsuccessful in treating leprosy with gold preparations he has found crisalbine in a total amount of 5 gm. in two series of weekly 10 cgm. doses had a good effect in a tuberculoid case in which hyrganol had failed. *L. R.*

Dubois (A.), Westerlinck (H.) & Degotte (J.). Essais thérapeutiques dans la lèpre : le manganyl. [**Manganyl in the Treatment of Leprosy.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Mar. 31. Vol. 15. No. 1. pp. 19–23.

The author reports a trial of the manganese preparation Manganyl in 25 cgm. doses intravenously without toxic symptoms. One patient died under circumstances not determined. Three maculo-nervous and two nodular cases did not show any active results of the treatment, but larger doses will be tried. *L. R.*

Roussel (J. N.). **Leprosy : a Report of Twenty-Seven Cases treated with Anthrax Vaccine.**—*Jl. Trop. Med. & Hyg.* 1935. June 1. Vol. 38. No. 11. pp. 133–136. Also in *Southern Med. Jl.* 1935. Aug. Vol. 28. No. 8. pp. 730–735.

Seventeen maculo-anaesthetic and 9 nodular leprosy cases have been treated in New Orleans by a vaccine made in Philadelphia said to contain living attenuated spore-bearing anthrax bacilli, of which over 700 injections were given without ill effects. No improvement was noted in the nodular cases, but the nerve cases are said to have benefited in the way of fading of the lesions in two-thirds of them, commencing two or three months after the injections were stopped. *L. R.*

Sorley (J. T.). **The Use of Brilliant Green Intravenously in the Treatment of Leprosy.**—*West African Med. Jl.* 1934. Oct. Vol. 8. No. 2. pp. 13–14.

Brilliant green was given in much smaller and less toxic doses than used by G. A. Ryrie, namely 3 cc. of a 1 per cent. solution twice weekly for three months in 24 cases. No bacterial or sedimentation improvement was obtained, but there seemed to be considerable clinical improvement. *L. R.*

De la Plaza (G.), Vegas (M.) & Gomez (B.). La neurotoxina de Cascabel (*Crotalus terrificus*) en las algias del brote nervioso en la lepra. [**The Treatment of Crises of Nervous Leprosy with Crotalus Toxin.**]—*Rev. Policlinica Caracas.* 1935. Apr. No. 21. pp. 1397–1402.

[The term " crisis " (algia) is employed here in the same sense as in tabes dorsalis, for exacerbations of pain, neuritic, arthralgic, etc., such as occur in leprosy.] The neurotoxin of *Crotalus terrificus* was prepared in the National Laboratory and put up in 2 cc. ampoules each containing 0·1 mgm. in glycerin, and the remedy was employed in 30 cases. In 14 the result is described as excellent, and in another 14 there was improvement [presumably alleviation of pain], in two only did it fail, and in many the relief followed promptly on its administration. [We cannot find in the account any statement as to the mode of its use, whether injected subcutaneously, or along the affected nerve, or at the nerve root, although a brief note is given of each of the 30 cases.] *H. H. S.*

Prudhomme (R. O.). Fixation *in vivo* du bleu de méthylène par les bacilles lépreux. [**Fixation of Methylene Blue by Lepra Bacilli** *in vivo*.]—*C. R. Soc. Biol.* 1935. Vol. 119. No. 27. pp. 1326–1328.

The author reports finding that the potential oxido-reduction of lepromes is not materially different from that of normal tissues, and that the substances which fix methylene blue to lepra bacilli belong to a series of substances which can be extracted by hot alcohol. *L. R.*

Paldrock (A.). Noch eine durch spezifische Behandlung geheilte Lepröse. [**Leprosy cured by specific Treatment.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. June. Vol. 39. No. 6. pp. 241–243. With 3 figs.

This author once more advocates the use of carbon dioxide snow locally and the injection intravenously of gold preparations in leprosy. *L. R.*

Ota (Masao), Sato (Saburo) & Masuzawa (Tatsuro). **A Chaulmoogra Preparation for Intravenous Use, and its Therapeutic Effect.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 153–164. [28 refs.]

The authors report their work on a preparation of chaulmoogra for intravenous use. They have made fine emulsions of the ethyl esters about 1 micron in diameter in a stable colloidal state containing from

10 to 50 per cent. of esters, and have used a 40 per cent. emulsion, as a standard, although for production in quantity a 10 per cent. emulsion has been adopted and named "esperol." A dose of 0·5 cc. per kilo of the 40 per cent. solution caused no unpleasant symptoms in rabbits, and single doses of 2·5 to 3 cc. up to 5 cc. have been injected intravenously into patients, but they find it is much safer to dilute the emulsion five to ten times with distilled water, normal saline or 4·5 per cent. glucose solution. Up to a total of 50 injections amounting to 148 cc. of the standard 40 per cent. emulsion have been given to one patient. Further experience is required to determine the value of this method, but they are convinced that it is not inferior to others yet used. *L. R.*

FRASER (N. D.). **A Village Clinic for Leprosy Treatment.**—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 204–206.

At the Swatow Mission Hospital in the Chinese province of Kwangtung over 1,000 cases of leprosy have been met with in six years and at least 10,000, or 5 per mille, are believed to be present in the district, of whom 100 are in a colony and 100 more attend a clinic. It was therefore decided to organize a village clinic with voluntary medical attendance, and by the end of the year about 100 patients were attending regularly for treatment, some coming ten to twenty miles for it. Iodized esters and alepol were used. The plan met with such success that other village clinics are to be started shortly. *L. R.*

CRUZ (M. C.). **Parenteral Administration of Fresh and Boiled Leprotic Emulsions in Lepers.**—*Jl. Philippine Islands Med. Assoc.* 1935. June. Vol. 15. No. 6. pp. 319–323.

In order to test if lepra reactions are caused by breaking down of numerous lepra bacilli, lepromata, some freshly ground, others boiled, were injected intravenously, intramuscularly and subcutaneously in lepers, but only very slight general reactions without anything like typical lepra reactions resulted, nor were any allergic reactions noted.

L. R.

CRUZ (M. C.). **Trial of High Fat Diet and Fixation-Abscess in Lepra Reaction.**—*Jl. Philippine Islands Med. Assoc.* 1935. Apr. Vol. 15. No. 4. pp. 214–220.

The methods of treatment of lepra reaction are considered and the administration of sodium bicarbonate and calcium chloride are stated to be the best at present available. A high fat diet has been suggested with a view to increasing the blood lipoids, as they are found to be low in those who are worse after severe reactions. Fixation abscesses were also tried because occasionally remarkable improvement has followed severe suppurative reactions with hyperleucocytosis. Cod-liver oil, butter and eggs were given for the first purpose, and injections of a total of 13·5 to 40 cc. of a turpentine-oil mixture in from 4 to 12 doses for the second, with resulting increases of the total leucocyte count of from 400 to 13,500 over the initial count, but no material increase in the total blood lipoids followed the special diets. The results showed no advantage in lepra reactions over the control cases, so further study of such reactions is required. *L. R.*

Dubois (A.), Westerlinck (H.) & Degotte (J.). Essais thérapeutiques dans la lèpre : le sulfate de cuivre. [**Sulphate of Copper in Leprosy.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Mar. 31. Vol. 15. No. 1. pp. 25–29.

The treatment of 47 cases of leprosy by intravenous injections of copper sulphate in 0·25 to 0·5 per cent. solutions, and total doses of 3 to 5 gm. in the course of 4 to 7 months is reported, but negative results were obtained in cutaneous, macular with few bacilli and in maculo-nerve cases with rare bacilli. *L. R.*

Summent (Peter). Klinische Betrachtungen ueber die Lepra und deren Behandlung. [**Observations on the Treatment of Leprosy.**]—*Dermat. Woch.* 1935. Aug. 17. Vol. 101. No. 33. pp. 1002–1006.

In this note the author records his general experience of leprosy in the Baltic area chiefly among the fishermen of the coast. He advocates the use of a tar sulphur powder for local application to ulcers.

L. R.

Arantes (Luiz). Da gynecomastia da lepra.—*Brasil-Medico.* 1935. June 8. Vol. 49. No. 23. pp. 511–520. With 7 figs.

Cochrane (Robert G.). Observations in the West Indies. [Correspondence.]—*Internat. Jl. Leprosy.* Manila. 1935. Apr.–June. Vol. 3. No. 2. pp. 228–229.

Nittis (Savas). Prominence of the Right Sterno-Clavicular Junction as a Sign of Early Infection in Leprosy.—*Jl. Egyptian Med. Assoc.* 1935. June. Vol. 18. No. 6. pp. 403–412. With 6 figs.

Pooman (A.). Eine zweckmässige Uebersichtsmethode der Leprabehandlung.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Jan. Vol. 39. No. 1. pp. 25–28.

Public Health Reports. 1935. Mar. 29. Vol. 50. No. 13. pp. 442–444. —Observations on the Epidemiology of Leprosy in Hawaii.

Rodriguez (J.) & Plantilla (F. C.). Observations on the Progress of "Incipient" or Early Lesions of Leprosy.—*Monthly Bull. Bureau of Health.* Manila. 1935. Mar. Vol. 15. No. 3. pp. 97–108. With 1 fig.

Schlossberger (H.). Die Behandlung der Lepra und der Tuberkulose mit Chaulmoograöl.—Reprinted from *Zent. f. d. gesamte Tuberkuloseforsch.* Vol. 42. No. 9/10. pp. 545–576. [7 pages of refs.]

Solana (Federico) & Gutiérrez-Solana. Sobre el cultivo "in vitro" del bacilo de Hansen.—*Medicina Paises Cálidos.* Madrid. 1935. Apr., May & June. Vol. 8. Nos. 4, 5 & 6. pp. 177–183; 233–246; 271–294. With 6 figs. [225 refs.]

Thompson (E. I.) & de Groat (A.). Macular Leprosy. Report of a Case occurring without Anesthesia.—*Jl. Amer. Med. Assoc.* 1935. Aug. 3. Vol. 105. No. 5. pp. 357–359. With 5 figs.

YELLOW FEVER.

i. James (S. P.). Renseignements concernant la fièvre jaune reçus pendant les 6 mois se terminant au 31 mars 1935. [**Information concerning Yellow Fever received during the 6 Months ending 31st March, 1935.**]—*Bull. Office Internat. d'Hyg. Publique.* 1935. July. Vol. 27. No. 7. pp. 1312–1316.

ii. Boyé. Les cas de fièvre jaune dans les colonies françaises en 1934. [**Cases of Yellow Fever in French Colonies during 1934.**]—*Ibid.* pp. 1317–1318. With 1 folding map.

iii. ——. La "fièvre rouge" congolaise et le test de protection amaril en Afrique équatoriale française. [**"Red Fever" of the Congo and the Yellow Fever Protection Test in French Equatorial Africa.**]—*Ibid.* pp. 1319–1321.

iv. Pridie (E. D.). Recherches concernant la fièvre jaune au Soudan anglo-égyptien depuis octobre 1934. [**Researches concerning Yellow Fever in the Anglo-Egyptian Sudan since October, 1934.**]—*Ibid.* pp. 1322–1323.

v. de Vogel (W. T.). Un bataillon soudanais en garnison dans un foyer de fièvre jaune. [**A Sudanese Battalion garrisoned in a Yellow Fever Centre.**]—*Ibid.* pp. 1324–1331. With 1 map.

vi. Schilling (Claus). Sur la question des régions à fièvre jaune "silencieuses". [**The Problem of "Silent" Yellow Fever Regions.**]—*Ibid.* pp. 1332–1336.

vii. Jorge (Ricardo). A propos de la fièvre jaune endémosporadique. [**Concerning Endemo-Sporadic Yellow Fever.**]—*Ibid.* pp. 1337–1341.

viii. Theiler (Max) & Whitman (Loring). Le danger de la vaccination par le virus amaril neurotrope seul. [**The Danger of Vaccination by Neurotropic Yellow Fever Virus Alone.**]—*Ibid.* pp. 1342–1347.

ix. Bulletin de l'Office International d'Hygiène Publique. 1935. July. Vol. 27. No. 7. pp. 1348–1349. Rapport de la commission de la fièvre jaune. [**Report of the Yellow Fever Commission.**]

i. During this period cases of yellow fever have been recorded from Gambia, Gold Coast, Ivory Coast, Niger Territory, Nigeria and Sierra Leone, in Africa; from Matto Grosso and Goyaz in Brazil; and from Restrepo in Colombia. The most important outbreak is that in the State of Goyaz with more than 100 cases [*ante*, p. 586].

The results of further protection tests confirm its value as an indication of the occurrence of yellow fever in the past, and the majority of workers are now of the opinion that yellow fever is the only disease which gives a positive reaction, although Boyé [*infra*, p. 875] maintains the possibility of it being non-specific. The use of the viscerotome for obtaining specimens of liver for pathological examination has not been made compulsory in Africa, but instruments have been sent to most of the British colonies. The general epidemiology of the disease is next discussed with special reference to recent rural outbreaks in Brazil. The fact that hedgehogs are susceptible to the disease, and the occurrence of immune bodies against yellow fever in wild monkeys in Brazil, supports the view that vertebrate hosts other than man occasionally may serve as reservoirs of infection.

In England, combined virus and immune serum is used for vaccination against yellow fever. As a general rule heterologous immune

serum is used in doses of 0·4 to 0·5 cc. per kilo body weight, and the only inconvenience of such serum is that occasionally the inoculation is followed by severe urticaria and arthritis. The method has also been used in other parts of the world and it is noted that practically all the European residents in Gambia have been vaccinated, a very satisfactory result, in view of the great practical difficulties of dealing with endemic yellow fever in this Colony.

ii. During 1934, 23 cases of yellow fever with 19 deaths have been recorded from the Senegal, Ivory Coast and Niger Territory. The French Sudan and Guinea have had no cases this year. The distribution of these cases is given in a map, which also includes records of cases during the years 1931, 1932 and 1933. STANTON records that in British colonies during 1934 there was a total of 10 European and 9 native cases, including 5 suspected cases in Nigeria, Gold Coast and Gambia.

iii. The author records the experience of a medical officer, GRALL, in the Oubangui district of the Congo, who a few months later travelled through regions where BURKE had found that many of the natives gave positive protection tests against yellow fever. According to GRALL, many of these cases had suffered from an obscure disease known as " Red Fever of the Congo " (*Fièvre rouge congolaise*) and it is suggested that this infection may have been responsible for these positive results. The author calls attention to this disease, as he considers that the possibility of obtaining a positive protection test in the absence of yellow fever has not been finally excluded. [See below, p. 881.]

iv. The livers of seven doubtful cases in the Sudan were examined histologically by FINDLAY and two of them were considered suspect. One of these cases had a history of jaundice, 7 days fever, coma and death, but his serum gave a negative protection test. The examination by means of yellow fever protection tests of 43 sera from cases of jaundice resulted in 9 positives ; 8 of these came from the south of the Sudan and the other from Wad Medani. The latter succumbed to an infection clinically resembling yellow fever, but sections of the liver were negative.

v. An interesting account of the medical history of the Sudanese battalion, recruited in Darfur and Kordofan, which was employed as a garrison from 1863 to 1867 at Vera Cruz during the Mexican war. The author has obtained his information from three military treatises on this expedition :—" *Mes souvenirs,*" by General DU BARAIL ; " *Cinq ans au Mexique,*" 1862–1867, by ADRIEN DE TUCÉ ; and " *L'expédition du Mexique* (1861–1869). *Récit politique et militaire,*" by G. NIOX.

The observations in these treatises abundantly confirm the view to which Prince Omar Tousson first called attention [see this *Bulletin*, Vol. 31, p. 834], that these Sudanese were immune against yellow fever, and consequently must have been exposed to infection before their arrival in Mexico. These historical facts correspond with the results of recent protection tests and show that yellow fever must have existed in the Sudan for long periods. The reason why it has never spread to the East Coast of Africa is attributed by the author to the sparsity of the population between the infected Sudanese provinces and the coast.

vi. The author discusses the problem of the existence of a considerable percentage of the population giving positive protection tests against yellow fever in regions where clinical cases of the disease have never been observed. He refers to KLEINE's examination of 101 natives of East Africa [see this *Bulletin*, Vol. 27, p. 558] none of whom

gave a positive Schick reaction, although there was no evidence of previous exposure to diphtheria. Similarly a commission for the study of tuberculosis in mine labourers in South Africa found that approximately 72 per cent. of the natives gave a positive tuberculin reaction, although tuberculosis occupies a very small place among the diseases affecting the districts from which they were recruited.

Various hypotheses have been advanced to explain these facts, one being the existence of latent infections, such as those observed in many laboratory cases of yellow fever, where characteristic symptoms may be completely absent. The author insists on the necessity of a detailed examination of any doubtful febrile cases in endemic areas, and the use of the viscerotome for the examination of the liver in patients who have succumbed to any febrile disease within 10 days.

A second explanation is the possibility of non-specific reactions analogous to Forssmann's heterogenetic antigens and antibodies ; or the para-agglutinations, such as that between *Proteus X 19* and serum containing typhus antibodies.

Another problem is whether a positive reaction against a virus that has been maintained by mouse passage, or in monkeys, necessarily signifies that the subject would be immune against virus inoculated by an infected mosquito. Similarly, where there is a high degree of latent infection is it possible for the virus to acquire a high degree of virulence ? a point of considerable importance in view of the danger of the transport of infected mosquitoes by aeroplanes. With reference to protection the author considers the simultaneous injection of virus and immune serum as the method of choice. Animal reservoirs are considered to be of very secondary importance in the spread of the disease in view of the very sharply defined geographical limits of the disease.

vii. The author presents various observations on the epidemiology of yellow fever, with special reference to conditions in Brazil, where recent investigations [*ante*, p. 585], have shown that there are two kinds of endemicity, one urban, affecting mainly the coastal towns, and the other " hinterlandic " resulting in the appearance of scattered centres of infection in sparsely populated areas. Whereas in the Gulf of Mexico, the suppression of the urban type has resulted in the complete disappearance of yellow fever, in South America a number of rural centres of infection have been left behind.

After mentioning the efficiency of mosquito control in Brazil and the value of the viscerotome, the " mouse test " is discussed with special reference to its specificity. Attention is again drawn to the results of the Schick test for diphtheria among native populations where the disease is extremely rare or absent. In Nigeria, for example, out of 1,758 natives, 81 per cent. neutralized the toxin and in Morocco out of approximately 2,000 subjects only four gave a positive reaction. Similarly in the United States the disease is much commoner among the white population than among negroes, and among those the incidence diminishes as one goes south. In the Bahamas, out of 300 black children only 4 were carriers of Loeffler's bacillus, whilst 90 per cent. gave a negative Schick test. These racial peculiarities may possibly have some parallel in the case of yellow fever, where the natives, especially in America, seem to show a relative immunity against the disease.

viii. A valuable discussion of the method of vaccination by means of neurotropic yellow fever virus alone, as advocated by LAIGRET. The authors' experiments confirm those of FINDLAY [*ante*, p. 285], that inactive virus produces no effect, and that any

resulting immunity depends on the injection of living virus. Consequently this method involves the danger of the presence of a neurotropic virus in the circulation. The large number of persons vaccinated by LAIGRET without obvious ill effects does not necessarily indicate that *rhesus* monkeys are more liable to develop encephalitis than human subjects. It is pointed out that LAIGRET's subjects were probably nearly all adults, whilst the *rhesus* monkeys used in laboratories are generally young animals and experiments have shown that the " haemato-cephalic barrier " is much more permeable in young animals than in adults. The authors consider that at present the simultaneous injection of neurotropic virus and immune serum is the best method to employ, as animal experiments show that it is much safer than the use of virus alone.

ix. The mouse protection test is considered of great value, but the question of its absolute specificity has not been proved conclusively. The importance of the viscerotomy test is emphasized and its use is advocated as a means of obtaining liver specimens in all countries where yellow fever might be suspected. With reference to vaccination, it is pointed out that no cases of yellow fever have occurred among any laboratory workers who have been vaccinated by either of the two methods in use, but it is necessary to follow the history of all vaccinated subjects in endemic areas. It is also emphasized that the use of vaccination does not authorize any relaxation in the continued application of general methods of control such as anti-mosquito measures, canalization of water, etc. *E. Hindle.*

DESNOS (E. H.). Sur la fièvre jaune en Afrique occidentale. [**Yellow Fever in French West Africa.**]—*Rev. Méd. et Hyg. Trop.* 1935. May–June. Vol. 27. No. 3. pp. 127–149. [16 refs.]

A general account of the present position of yellow fever in French West Africa, based on statistical enquiries and also clinical observations by the author and his colleagues.

Tables are given showing the number of cases in French colonies each year from 1909 to 1933 inclusive. The author then gives particulars of other outbreaks previous to 1909 which were suggestive of yellow fever, followed by personal observations on atypical cases of the disease, both in natives and Europeans.

It is concluded that the disease shows oscillations in its distribution, importance and severity and among possible causes are suggested climatic variations ; movements of masses of the population and works involving the use of much labour ; the possible disappearance of immunity in the native ; an insufficient knowledge of what animals may harbour the virus ; and an incomplete knowledge of insect-carriers.

E. H.

ANNALES DE MÉDECINE ET DE PHARMACIE COLONIALES. 1935. Apr.–May–June. Vol. 33. No. 2. pp. 446–448.—Deux observations de fièvre jaune chez des indigènes de la région de Toumodi (Côte d'Ivoire). [**Two Cases of Yellow Fever in Natives from the Neighbourhood of Toumodi (Ivory Coast).**]

A record of two fatal cases of yellow fever in African negroes. The patients both showed typical clinical symptoms and also characteristic pathological and histological changes. *E. H.*

Annales de Médecine et de Pharmacie Coloniales. 1935. Apr.–May–June. Vol. 33. No. 2. pp. 436–446.—Résultats des recherches concernant le test de protection contre la fièvre jaune dans les colonies françaises d'Afrique. [**The Results of Researches with Reference to the Protection Test against Yellow Fever in the French African Colonies.**]

A general account of the results obtained by various investigators in the study of the endemicity of yellow fever in French African colonies by means of the mouse protection test. The results have all been published previously, but the article in question furnishes a convenient summary. *E. H.*

Soper (Fred L.). **Rural and Jungle Yellow Fever—a New Public Health Problem in Colombia. (Lecture given before the Faculty of Medicine of Bogotá, April 5th, 1935.)**—42 pp. With 13 figs. on 6 plates. [31 refs.] 1935. Bogotá: Editorial Minerva, S.A.

A valuable summary of the subject, based mainly on the author's observations made under the auspices of the International Health Division of the Rockefeller Foundation and of the Departmento Nacional de Higiene of Colombia.

Most of the points discussed by the author have been dealt with by Morgan [*ante*, p. 585] in his account of the Co-operative Yellow Fever Service in Brazil. After a description of recent laboratory and epidemiological progress in our knowledge of the infection, special attention is devoted to rural and jungle outbreaks. It is shown that suspected cases of yellow fever have been described from Muzo at various intervals since 1907, although the proof of its endemicity by protection tests was demonstrated only in 1931 and 1932, and proof of actual cases by autopsy only in March, June and October, 1934. Other outbreaks have also been identified at Caparrapi in 1933, and Restrepo in 1934. These cases occurred in the absence of *Aëdes aegypti*, and some other species must be the carrier. The most common mosquito is *Haemagogus equinus*, the "blue" mosquito, which is a vicious biter in the field, generally attacking the feet and ankles, even when men are actively at work. This jungle yellow fever seems to be especially dangerous where the human population is least, but is in most intimate contact with jungle life and one is compelled to assume the existence of animal reservoirs of the infection. Monkeys abound in these neighbourhoods and out of five specimens collected at Muzo, four gave positive protection tests and the other inconclusive results.

There is little doubt as to the identity of the jungle yellow fever and the urban type since the clinical course and pathological changes are the same in both. Also cross-protection tests of known immune sera with the viruses from urban and jungle yellow fever are positive. In the laboratory yellow fever virus adapted to *Aëdes aegypti* is readily transmitted by several other mosquitoes, and epidemics with and without *Aëdes aegypti* have been observed in Bolivia as part of the same outbreak. Moreover, the most reasonable explanation of the Bucaramanga and Socorro epidemics is that the source of the epidemics was in nearby areas of jungle endemicity.

The difficulty of combating these jungle outbreaks is very considerable, and up to the present control measures applicable to such conditions are unknown. The protection of urban populations, on the other hand, is only a problem of administration and a list is given of the

recommendations of the Ninth Panamerican Sanitary Conference regarding yellow fever. Finally, the author outlines a program of studies in Colombia and urges the necessity of a yellow fever section of the National Laboratory.

The article should be read in its entirety by all those interested in the subject. *E. H.*

LAIGRET (J.). La vaccination contre la fièvre jaune. [**Vaccination against Yellow Fever.**]—*Tunisie Méd.* 1935. June. Vol. 29. No. 6. pp. 225–234.

A general account of the subject with special reference to the method of vaccination advocated by the author and the results of its application in French West Africa. *E. H.*

KOPCIOWSKA (L.). Neuro-infection autostérilisée non mortelle avec présence d'inclusions intranucléaires, dans la fièvre jaune expérimentale du cobaye conférée par inoculation sous-dure-mérienne. [**Non-fatal Infection of the Nervous System with the Presence of Intranuclear Inclusions in Guineapigs Infected with Yellow Fever by Sub-dural Inoculation.**]—*C. R. Soc. Biol.* 1935. Vol. 119. No. 22. pp. 714–716.

The author has examined the brains of three guineapigs which were inoculated sub-durally with yellow fever virus and recovered without showing any definite clinical symptoms. Typical yellow fever inclusion bodies were found in all three animals, although many of these bodies were in course of disappearance. The inoculation of material from these guineapigs into normal guineapigs in no case resulted in the production of infection, showing that the virus had died out in spite of producing the typical intranuclear bodies. *E. H.*

WHITMAN (Loring). **The Response to Yellow Fever Virus in the Non-susceptible Rabbit.**—*Jl. Immunology.* 1935. Aug. Vol. 29. No. 2. pp. 99–110.

The authors tested the production of yellow fever antibodies in the rabbit, an animal which seems to be nonsusceptible to the infection.

Experiments with rabbits using neurotropic virus confirmed the view that there is no multiplication of virus in this animal after either intracerebral or intraperitoneal inoculation, since it fails to develop in the brain, and after 48 hours cannot be detected in the circulation.

The inoculation of virus, in every case, was followed by the development of antibodies capable of passively protecting susceptible animals against infection. The inoculation of a single dose of virus and subsequent protection tests in mice, showed that the titre of the serum depended to some extent on the amount of virus injected, the rabbits receiving larger doses giving higher titres than any of the others. Multiple injections were found to have little advantage over either single injections of an adequate amount, or two widely spaced injections. The most striking increase in titre was obtained by giving a second injection of virus into a previously immunized animal, after an interval of six or more weeks from the first injection, even small doses producing a serum titre ten to twenty times higher than that previously obtained. This increase is transient, but indicates the possibility of obtaining hyper-immune serum, and reducing the volume required for the present system of serum-virus vaccination. *E. H.*

THEILER (Max) & WHITMAN (Loring). **Quantitative Studies of the Virus and Immune Serum used in Vaccination against Yellow Fever.**—*Amer. Jl. Trop. Med.* 1935. May. Vol. 15. No. 3. pp. 347–356.

An account of experiments in monkeys showing that the injection of living neurotropic virus, such as that used in human vaccination, is followed by a multiplication of the virus in the blood to a considerable concentration, unless previously a sufficient dose of immune serum is administered.

The results are of great importance in view of the two methods of yellow fever vaccination at present in use. They show, without any question, that if human beings are as susceptible to encephalitis as monkeys, the method advocated by SELLARDS and LAIGRET [see this *Bulletin*, Vol. 29, p. 572] is potentially dangerous to both the person vaccinated and the community.

This risk cannot be removed by reducing the amount of virus inoculated, for in monkeys infinitesimal doses seem, if anything, to be more likely to result in encephalitis than larger doses, even in the presence of small quantities of immune serum.

The inoculation of immune serum shortly before the administration of virus prevented the circulation of virus, and yet allowed active immunization. The amount of serum necessary is more closely related to the size of the host than the dose of virus, for even by reducing the virus component 100,000 times the dose of immune serum could only be reduced five times. Hyperimmune serum was found to be much more efficient, and smaller quantities were as effective as larger doses of average immune serum.

When the optimal amount of immune serum has been ascertained a wide range of virus concentration can be used with success, but minimal doses probably fail to produce immunity. *E. H.*

KOTTER (G. F.) & VAN DEN BERGHE (L.). Filtratieproeven van neurotroop gele koorts virus door Seitzfilters. [**Filtration Tests on the Passage of Neurotropic Yellow Fever Virus through Seitz Filters.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. June 30. Vol. 15. No. 2. pp. 213–220. With 1 fig. French summary.

The authors have tested the infectivity of Seitz filtrates of infected mouse brains. The results clearly indicate that the last part of the filtrate is more virulent than the first, the filter becoming more permeable to the virus after the passage of a certain amount of the suspension. It is recommended that when making tests of this nature it is advisable to use the last portion of the filtrate of the virus suspension. *E. H.*

NICOLLE (Charles) & LAIGRET (J.). La vaccination contre la fièvre jaune par le virus amaril vivant, desséché et enrobé. [**Vaccination against Yellow Fever by Means of Living Yellow Fever Virus Dried and "Coated."**]—*C. R. Acad. Sci.* 1935. July 29. Vol. 201. No. 5. pp. 312–314.

The authors mention that during the year 10,000 persons have been vaccinated against yellow fever by means of three injections of dried

virus [see this *Bulletin*, Vol. 31, p. 79]. Only three accidents have been recorded, two cases of meningitis and one of myelitis, but all the patients recovered.

With the object of reducing the number of inoculations the authors have tried the method of coating the dried virus with a layer of egg-yolk, or of olive oil, or with a double envelope of both agents. The object of this envelopment, or coating, which has been used by RAMON in the case of toxins, is to retard the diffusion of the material from the site of inoculation.

Twenty-two subjects have been inoculated with a single dose of either 320, 640, 800 or 4,000 mouse units of the dried virus, prepared in the usual way from infected mouse-brains but suspended in olive oil, neutralized and washed in alcohol. No local reactions were observed, and the rise in temperature on the 6th or 7th day, frequently seen after the ordinary vaccination, was always absent. Protective bodies appeared in the blood 19 days after the inoculation.

Another 21 subjects were vaccinated each with single doses ranging from 320 to 6,000 mouse units, similarly prepared, but suspended in egg-yolk (10 per cent. yolk in water). There were no local reactions or rises in temperature except in one case, where there was a slight fever on the 14th and 15th days. A series of 48 subjects were vaccinated each with 2,000 to 4,000 mouse units, similarly prepared but coated with two layers, one of egg-yolk and a second of olive oil. These inoculations produced no local reaction, no febrile attacks, nor any signs of anaphylaxis.

The authors advocate the use of single inoculations of the dried virus coated with egg-yolk as the simplest method of vaccination and consider that a dose of 320 mouse units is quite sufficient. *E. H.*

GRALL (Georges). Note sur le bakandjia ou fièvre rouge congolaise. [**A Note on " Bakandjia " or Red Fever of the Congo.**]—*Ann. de Méd. et de Pharm. Colon.* 1935. Apr.–May–June. Vol. 33. No. 2. pp. 448–451.

The description of the clinical symptoms observed in an epidemic of an eruptive fever during 1929 at Oubangui-Chari in the Congo.

The onset is characterized by general malaise, asthenia, stiffness in the back and limbs, and slight headache. After 24 to 48 hours there is an eruption of small red spots, at first generalized on the face, then spreading to the body and limbs, accompanied in most cases by moderate fever with slight bronchitis and diarrhoea. The eruption lasts 3 days, then disappears rapidly together with the accompanying symptoms, and the patient recovers completely in a few days without any sequelae. It attacks infants rather than adults and is benign, no fatal cases having been observed. The epidemic came from the north and travelled south from village to village along the main routes.

The disease is apparently well known to the natives of Banda and also to Europeans living in the Oubangui district. It is considered to resemble the disease described by CLAPIER in 1921 as a fever recalling dengue, and also that described by LEFROU at Brazzaville in 1928 and called by him " Fièvre rouge congolaise."

The author states that all the natives in this district who gave a positive yellow fever protection test had suffered from the above

mentioned disease when young, therefore he is of the opinion that the test is not specific unless one assumes a relationship between the two diseases, which is certainly not shown in the clinical manifestations.

E. H.

Hoffmann (W. H.). La endemicidad amarilla en el Africa.—Reprinted from *Sanidad y Beneficencia.* Habana. 1934. Vol. 37. No. 7–12. pp. 346–357.

Mathis (M.). Sur la nutrition sanguine et la fécondité de Stegomyia : *Aëdes egypti.—Bull. Soc. Path. Exot.* 1935. Mar. 13. Vol. 28. No. 3. pp. 231–234.

Morgan (M. T.). Notes sur un voyage au Brésil pour étudier le service coopératif antiamaril.—*Bull. Office Internat. d'Hyg. Publique.* 1935. Aug. Vol. 27. No. 8. pp. 1504–1533. With 6 figs. (2 maps). [See this *Bulletin, ante,* p. 585.]

Soper (Fred L.). El problema de la fiebre amarilla en América.—*Bol. Oficina Sanitaria Panamericana.* 1935. Mar. · Publicación No. 98. 10 pp.

YAWS AND SYPHILIS.

TURNER (Thomas B.) & SAUNDERS (George M.). **Report of the Jamaica Yaws Commission for 1933.**—30 pp. With 7 maps & 12 charts. 1933. Dec. 31. Kingston, Jamaica, B.W.I.

In this, the second, report of the Jamaica Yaws Commission the problems under study during the year are dealt with in four main categories—(1) treatment, (2) transmission, (3) the relation of yaws and syphilis, (4) immunity. [For the first report see above, p. 50].

For all those interested in anti-yaws campaigns the methods adopted in Jamaica will have a particular interest. In the five areas surveyed 6,300, or 50 per cent. of all individuals, gave a history of yaws but of these only 652, or 5·2 per cent., presented lesions considered to be infectious although perhaps an equal number could be classed as potentially infectious; 96·2 per cent. of the infectious cases were treated. The effect of treatment was seen on re-survey, three months after a treatment campaign, of an area in which shifts of population were not marked, when only 17·5 per cent. of the number of infections originally observed were found.

As regards the evaluation of different drugs in treatment, it is stated that "the relapse rate for patients treated with bismuth salicylate is enormously higher than for those treated with neoarsphenamine." "Preliminary observations indicate that the beneficial results of treatment with the latter increase rapidly with the number of injections up to three and slowly thereafter." Halarsol and carbarsone were of little use; mapharsen may be found useful. The following table here reproduced shows results of treatment after one year:—

Drug	Clinical Diagnosis	No. of Cases	*Result Unsatisfactory		Serology after one year	
			No.	Per cent.	Wassermann. Per cent. positive	Eagle Flocculation. Per cent. positive
Neoarsph. ...	Infectious type	40	3	7·5	21·6	52·7
6 weekly doses ...	Other ...	64	7	10·9	54·0	83·5
	Total ...	104	10	9·6	42·0	72·0
Bismuth salicylate	Infectious type	63	27	43·0	68·0	81·0
6 weekly doses ...	Other ...	69	13	18·8	57·0	81·0
	Total ...	132	40	30·1	63·0	81·0

*Failed to heal or relapsed.

[Much work will have to be accomplished before the question of the treatment of yaws is established on a firm basis; the results above given cannot be considered as very satisfactory. Reference is made to working out "the time relation of infectious relapse to treatment"; when this is done it will probably be found that very much longer courses of treatment, probably combined treatment, will be necessary.]

Reference to the fly *Hippelates* was made in the first report. Further evidence is now adduced in support of the view that this insect plays an important part in the transmission of yaws in Jamaica. They feed with avidity upon open skin lesions in great numbers and *Sp. pertenuis* can be found later in the gut of the fly, actively motile up to 3–8 hours, while non-motile ones have been found in the oesophageal diverticulum or stomach in abundance after 48 hours. As many as 304 have been found in a single fly. Experiment shows that the spirochaetes were killed very rapidly by drying and that they lose their motility at once in contact with water or mud. Infectious material from yaws lesions on ringed slides kept at various temperatures was examined; at 37°C. marked decrease in motility of the spirochaetes in 1 hour, complete loss in 6 hours. At room temperature motility remained up to 8 hours. At ice-box temperature motility was preserved for 24–60 hours.

The conclusions come to in regard to yaws and syphilis upon a study of early cases of the two diseases as seen side by side in Jamaica are as follows :—Syphilis in the Jamaican negro resembles the disease in the negro in the United States. The cases of syphilis in rural Jamaicans resemble the disease as seen in the Jamaican negro town dwellers. Yaws in adults resembles yaws in children. Yaws in the town dweller differs in no way from yaws in the rural population. A comparative study of the disease picture in rabbits produced by 4 strains of *Sp. pertenuis* and 7 strains of *Sp. pallida* has shown significant differences which are regarded as characteristic of the two diseases.

The following note is of interest in regard to immunity. In 15 cases of yaws attempts to produce a lesion by homologous inoculation with virus failed, in one even before the generalized eruption had appeared. With heterologous virus inoculation, however, a lesion can be produced in a large proportion of cases.

The age of onset of yaws was determined in 6,353 cases. The peak of the curve is at about 7 years; 91 per cent. of all cases acquire yaws before the age of 15 years. The percentage of yaws males acquiring the disease after twenty is 1·7 as compared with 2·8 for females. The incidence of yaws varies in different districts from 40 to 60 per cent. Of 6,353 cases of yaws 1,694 or 26 per cent. showed lesions. Of these 10 per cent. were infectious and 16 per cent. non-infectious lesions.

About 56 per cent. of cases with lesions have had yaws less than five years, 80 per cent. of the infectious cases and 40 per cent. non-infectious. Among 518 cases there were 220 or 43 per cent. who had only ulcerative plantar yaws as their infectious lesion. Primary lesions occurred on the leg or foot—arm, hand, face—trunk in the proportion 91 : 15 : 6.

There appears to be no racial immunity. The following figures give the total number of each race and the percentages diagnosed as yaws cases :—Black 10,335–20·2; Brown 1,434–17·5; Chinese 712–10·1; East Indians 86–8·6; White 9–0. All the facts seem to point to chance of contagion and trauma as the two great factors in infection.

Some observations on neurological and cardio-vascular lesions were made. Cases exhibiting any type of paralysis were noted by the field survey inspectors. Thirteen cases out of a population of 12,500 were examined; of these 7 " showed lesions which are not uncommon in syphilis " ; none gave a history of syphilis but all had had yaws—age 16, spastic paraplegia; 47 ? tabes; 25, hemiplegia; 45, paraplegia; 25, spastic paraplegia; 33, hemiplegia; 63, hemiplegia. The cardio-vascular cases were diagnosed at the clinic and consisted of 2 young

adult males with signs of aortitis and insufficiency. [The findings in these cases, however, go but very little way towards proving them to be framboesial in origin.] *H. S. Stannus.*

JAMAICA. **Report of the Jamaica Yaws Commission for 1934** [SAUNDERS (George M.), Clinical Director].—30 pp. With 7 graphs, 5 figs., 6 charts & 2 maps.

In this report for 1934, a brief account of the work done in the two previous years is given, followed by a description of the program carried through during the past year by the two treatment units, the Central Laboratory and the Special Unit. The results are presented in tabulated form and are unsuitable for summarization. The results of treatment with neoarsphenamine and bismuth salicylate are discussed. Both clinical findings and serological tests indicate that bismuth is the more useful drug when results are estimated without reference to existing climatic conditions.

A study of the relationship between rainfall and relapsing yaws lesions indicated that more lesions occur during the periods of high rainfall. Allowing for the effect of rainfall, the results obtained with neoarsphenamine would probably be slightly better than with bismuth. In areas subjected to control work for one year the number of persons with infectious yaws lesions at the end of the year was 14 per cent. of those at the beginning ; the number of new infections in the year was 8 per cent. of the number for the previous year. Evidence is adduced to show that most infections are contracted by contact with other cases.

Further work on the " eye gnat "—*Hippelates pallipes*—as a possible vector of *Sp. pertenuis* is chronicled. " Transmission, probably by regurgitation of an infected ' vomit drop,' would occur only if flies fed on infectious lesions and then on non-infected ulcers or surface abrasions on the same day, with an interval of seven hours or less elapsing between the insects passing from the patient to the non-infected person." There was no evidence of any cyclical development of the spirochaetes in the flies. A fuller account of the entomological studies follows. *H. S. S.*

KUMM (Henry W.). **Annual Report—Entomological Studies made for the Jamaica Yaws Commission during 1934.**—*Report Jamaica Yaws Commission for 1934.* pp. 19–30. With 5 figs. & 7 graphs.

Dr. Kumm brings forward evidence which very strongly suggests that the minute fly *Hippelates pallipes* is not only a potential but an actual carrier of the causative organism of yaws.

Dr. Kumm has observed *Hippelates pallipes* in enormous numbers on ulcers and has collected them at a rate equivalent to 5,000 flies per hour on one ulcer. The ulcers visited by flies are due to many causes of which yaws is the most frequent. It is observed that the flies will crawl under a scab and that they ingest large numbers of *Spirochaeta pertenuis* : moreover they feed intermittently, passing from man to man or man to animal. The *Sp. pertenuis* survives about seven hours in the anterior part of the gut of the fly and is probably transmitted by regurgitation.

The author's studies, which are very full, have shown that a number of Oscinidae closely related to *Hippelates pallipes* occur in Jamaica.

They may be easily trapped, but they are not attracted to man. It appears then that the one species alone is responsible for the transmission of yaws : this is supported by the rarity of the fly in Kingston, a place from which yaws is absent, though there are areas in Jamaica in which the fly is abundant in the absence of yaws.

A considerable section of the report deals with the bionomics of the flies, the time of day at which they feed, the meteorological conditions associated with their abundance and similar matters. The insect has been bred in the laboratory but the early stages have not been found in nature.

The report is an interesting piece of work based on a large body of fact. *P. A. Buxton.*

KUMM (Henry W.). **The Digestive Mechanism of One of the West Indian "Eye Gnats,"** *Hippelates pallipes* **Loew.**—*Ann. Trop. Med. & Parasit.* 1935. Oct. 5. Vol. 29. No. 3. pp. 283–302. With 3 figs. & 2 plates.

The author describes the anatomy and functions of the alimentary canal of *Hippelates pallipes*, an Oscinid fly concerned with the transmission of yaws in Jamaica.

The insect feeds on the surface of ulcers taking relatively great quantities of serum, and it has been observed that if it takes up *Sp. pertenuis* these organisms can live to about eight hours in the oesophageal diverticulum and for shorter periods in the mid-gut. During the first few hours after feeding it may frequently be observed that the fly regurgitates fluid on to the tip of the proboscis : sometimes the drop of liquid is swallowed again and it is suggested that the fly is passing it from the oesophageal diverticulum into the mid-gut in order to digest it. At other times the drop of fluid is deposited by the fly, and living *Sp. pertenuis* have been observed in it, so that presumably they might gain entrance to a second person by this mechanism. It is found that flies will deposit several spirochaetes per hour for the first few hours after feeding.

The mouth parts of this insect were described many years ago by GRAHAM-SMITH, who figured projecting spines on the pseudotracheae on the labellae. It appears that the spines are capable of cutting soft tissues and giving entry to micro-organisms. In the present paper the author extends our knowledge of the anatomy of the alimentary canal so far as it can be seen by dissection. *P. A. Buxton.*

KUMM (Henry W.), TURNER (Thomas B.) & PEAT (Alfred A.). **The Duration of Motility of the Spirochaetes of Yaws in a Small West Indian Fly**—*Hippelates pallipes* **Loew.**—*Amer. Jl. Trop. Med.* 1935. Mar. Vol. 15. No. 2. pp. 209–223. With 3 figs.

Anyone who has watched flies feeding on yaws sores will have speculated upon the possible part they may play in the transmission of the disease, and some authors have laid stress upon the point. Thus SCHILLING (1770), cited by HERMAN, suggested that yaws was probably carried by a small fly, the "Yaws fly," in Surinam. NICHOLS in St. Lucia (1912) believed a fly which he called *Oscinis pallipes* to be the vector of the infection upon injured skin surfaces. WILSON and MATHIS (1930) thought that *Hippelates pallipes* acted in the same way in Haiti. Transmission experiments are, however, few. CASTELLANI

carried out some work with *Musca domestica*. More recently THOMSON and LAMBORN have published results obtained in Nyasaland.

The present paper deals with the fly *Hippelates pallipes*, the female of which is found to feed in enormous numbers on yaws lesions in Jamaica, estimated at 2,700 flies caught per man per hour.

Two hundred and sixty-nine flies were fed on yaws lesions containing spirochaetes in large numbers. In 78·1 per cent. *Sp. pertenuis* was found in the stomach or eosophageal diverticulum or in both. In the 210 infected flies 3,617 *Sp. pertenuis* were counted. The majority of the organisms were found in the diverticulum during the first eight hours where they remain motile. Later they are found chiefly in the stomach where motility is rapidly lost. Very few spirochaetes remain in the proboscis, and those that do lose their motility quickly.

H. S. S.

TURNER (Thomas B.) ; SAUNDERS (George M.) ; JOHNSTON (H. M.), Jr. **Yaws in Jamaica. I. An Epidemiological Study of Two Rural Communities** [TURNER & SAUNDERS].—*Amer. Jl. Hyg.* 1935. May. Vol. 21. No. 3. pp. 483–521. With 2 charts & 2 figs. **II. A Plan of Control based upon Treatment** [TURNER, SAUNDERS & JOHNSTON, Jr.].—*Ibid.* pp. 522–539. With 1 fig.

In these two articles the authors deal with some observations collected in Jamaica during investigations made under the auspices of the International Health Division of the Rockefeller Foundation and the Government of Jamaica.

Two reports of the Jamaica Yaws Commission have already been published and received notice in this *Bulletin*. The present articles cover part of the same ground but deal in greater detail with the two sides of the subject mentioned in their titles. They are of great importance and should be read by all interested in anti-yaws work as it is the first time the problem has been tackled on anything like a proper basis.

It is not possible to condense the information contained in these papers but some idea of the subject matter may be drawn from the authors' own summaries :—

I.—" 1. An epidemiological study of yaws was made in the communities of Bath and Seaforth in Jamaica, B.W.I. Pertinent data were secured on 94·8 per cent. of 2,708 inhabitants of the Bath area, and on 100 per cent. of 1,967 inhabitants in the Seaforth area.

" 2. In the Bath area, 58·3 per cent. of the known population gave evidence of having had yaws, while in the Seaforth area the incidence of yaws among the total population was 47·3 per cent. In another, 6·8 per cent. and 5·9 per cent., respectively, blood Wassermann tests were positive in the absence of a history of yaws or syphilis. Only 0·5 per cent. of the population of each area presented evidences of having had syphilis.

" 3. Among successive age groups of the general population of each area, there was a rise in the incidence of yaws up to the age of 15 years, after which a decline was noted. Among children aged 10 to 14 years the incidence was 75·2 per cent. for the Bath area and 59·3 per cent. for the Seaforth area. Yaws was many times more prevalent among children under the age of 5 years in the Bath area than in the Seaforth area.

" 4. Among more than 1,800 persons who had had yaws, in over 90 per cent. the disease was acquired before the age of 15 years.

" 5. The attack rate for the general population during each of two successive years was many times higher for persons under 20 years than for persons over this age. The attack rate among previously unaffected or non-immune persons was also much higher among children than among adults. In each area the highest rate was observed for the age group 5 to 14 years, although in general the rate for all age groups was higher in the Bath area than in the Seaforth area. The hypothetical level of infection for various age groups calculated from the observed attack rate among non-immunes was in close agreement with the actual level of infection found on survey.

" 6. In each area the incidence of yaws was higher among males than among females for nearly all age groups except children under 5 years of age. The difference was particularly marked among persons 5 to 20 years of age.

" 7. There were no consistent differences in the prevalence of yaws among children of different racial groups, although in the Bath area the incidence was lower among children of mixed white and negro blood than among pure negroes or East Indians.

" 8. In each area yaws was somewhat less prevalent among children belonging to the upper social-economic class than among those belonging to the lower class.

" 9. Yaws was less prevalent among children residing in the central village of each area than among those living in strictly rural areas. There is evidence which suggests that this was not due to differences in the standard of living of the two groups.

" 10. Over 90 per cent. of the cases of infectious yaws, in each area, were observed in persons under 20 years of age.

" 11. In approximately 75 per cent. of persons with yaws the initial lesion occurred on the lower legs or feet.

" 12. The bearing which these observations may have upon the problems of treatment and of transmission is discussed.

II.—" Methods are described which aim at the control of yaws by the reduction, through treatment, of the sources of infection in a community. The plan consists of three principal phases : first, a survey of all the inhabitants of a district to find those with infectious yaws lesions ; secondly, treatment of these persons with appropriate drugs ; and thirdly, subsequent supervision of the district by resurveys for the purpose of discovering new infectious cases which, in turn, are subjected to treatment.

" These measures are based upon the following observations : The clinical manifestations of yaws are such that persons with infectious lesions can be ferreted out from the general population with a high degree of efficiency by non-professional assistants (sanitary inspectors). In endemic yaws areas, over 90 per cent. of the patients presenting infectious lesions are under 20 years of age, and the total number of infectious cases is usually less than 10 per cent. of the general population.

" This plan of control has been applied in Jamaica to an increasing extent during the past 2 years. In one area, during the first year after treatment, the attack rate of yaws among susceptible persons was approximately one-fifth the rate for the 2 years preceding the institution of these measures. In other areas the results were equally promising.

"In a small series of cases the results of treatment with neo-arsphenamine were found to be considerably superior to those with bismuth salicylate or halarsol." *H. S. S.*

PEÑA CHAVARRÍA (A.) & ROTTER (W.). **Frambesia in Costa Rica.**—*Puerto Rico Jl. of Public Health & Trop. Med.* 1934. Sept. Vol. 10. No. 1. pp. 129–132. With 8 figs. on 6 plates. [Spanish version pp. 125–128.]

A short note upon the occurrence of yaws in Costa Rica.

The disease has probably existed since the early days of colonization by Spain in Panama and Colombia and thence spread to Costa Rica. The disease probably exists in the interior of the country but appears only recently to have been introduced into the Atlantic section. Reference is made to the writings of FALLAS and VON BÜLOW (1925) and of NÚÑEZ (1925).

A couple of cases are described and figured and a note on the histology of a lesion is given: all are typical. *H. S. S.*

BUTLER (C. S.). **Epidemiology of Yaws.**—*Arch. Dermat. & Syph.* 1935. Sept. Vol. 32. No. 3. pp. 446–450.

A short article in which an attempt is made to disprove four points made by HASSELMAN in 1931 in regard to yaws—"(1) limitation to the tropics, (2) spotty distribution, (3) lowered resistance of *T. pertenue* as compared with that of *T. pallidum*, (4) the effect of altitude in making the lesions of yaws centre in the mucocutaneous junctions."

The author believes that yaws occurs outside the tropics and in support of this belief cites the disease described as yaws in N. Carolina and Massachusetts by some authors of the middle of the 18th century and the treponematosis described by HUDSON in Syria and the disease described by GRIN in Yugoslavia. [Others reading the descriptions given by the several authors quoted have put another interpretation upon these observations.]

In regard to the spotty distribution of yaws and its limitation to non-urban native communities, the author says "It is absurd to contend that yaws stops at the outskirts of city communities where there is a world of eligible hosts inviting it to enter," and refers to a single observation in Guam to support his idea. [This in face of an enormous amount of evidence adduced by others.]

[Points (3) and (4) are hardly worth discussion as observations are too few to be of much value one way or the other.] *H. S. S.*

BUTLER (C. S.). **On the Initial Lesion in Treponematosis Framboesiana.**—Reprinted from *Amer. Jl. Clin. Path.* 1935. May. Vol. 5. No. 3. pp. 231–237.

In this paper read before the Brooklyn Surgical Society the author reiterates some of his opinions concerning yaws, which may be summed up best perhaps in his own words—"I contend that yaws so-called is syphilis acquired usually by innocent contact." There is nothing essentially new and in great part the article is a criticism of experimental work on this disease. *H. S. S.*

Peltier (M.) & Riou (M.). Présentation d'un malade. Syphilis ulcéro-végétante ou pian ? [**Multiple Lesions : Framboesial or Syphilitic ?**]—*Bull. Soc. Path. Exot.* 1935. Feb. 13. Vol. 28. No. 2. pp. 53–57.

The patient shown was a 29-year-old colonial infantryman with service in Morocco 1925–26, Indochina 1928–29, Morocco 1932–34, and a history of a spirochaete negative chancre on the penis in 1928. The chancre healed in three days after cauterization, the W.R. was negative, no treatment was given and he remained symptomless until the present illness developed in September 1934, the first lesion being a large vegetative one between the big and second toe. This was followed by a similar dark crusted lesion of the dorsal surface of the toe and then by an eruption on the trunk, accompanied by marked itching, some debility, a change in voice timbre and falling of the hair of the scalp and eyebrows.

When examined he presented large " papulo-végétante " plaques in two interdigital spaces of the left foot. On the body were seen some 30 " nummullaires " elements varying in size from a 50 centime piece to a 2 franc piece, brownish red in colour, not infiltrated. Others were noted on the scalp and forehead. Other lesions—" papules érosives et infiltrées," some covered with a brown crust, were discovered about the anus, the right labial commissure and in the left antecubital fossa. These lesions were definitely ulcerative. Treponemata were found in numbers in all the lesions. There was also redness and ulceration of the throat which cleared up without treatment. The authors faced with this rather unusual evolution suggest that the case may be one of yaws and not syphilis. [It seems to the reviewer that no good case has been made out for so regarding it.] *H. S. S.*

Carman (J. A.). **The Relationship of Yaws and Syphilis. Are they Two Diseases or One ?**—*East African Med. Jl.* 1935. Aug. Vol. 12. No. 5. pp. 135–149. [32 refs.]

An address given in Nairobi in which many of the well-known arguments for and against the identity of yaws and syphilis were discussed without perhaps adducing any new facts or new arguments. The author pronounces in favour of there being two separate diseases.

H. S. S.

Sollini (A.). Pian e sifilide unicismo o dualismo. [**Yaws and Syphilis : One or Two Diseases.**]—*Arch. Ital. Sci. Med. Colon.* 1935. Aug. 1. Vol. 16. No. 8. pp. 616–625. English summary (2 lines).

The author brings together the opinions of those who have written on the subject of the unity or duality of yaws and syphilis during the last 4–5 years and states them fairly. He then gives his own opinion, siding with the dualists. He maintains that many medical men join the service [he is speaking mostly of the Belgian Congo] when young and after ample training at home in the diagnosis of syphilis but with merely a theoretical knowledge of yaws ; they naturally class doubtful lesions as syphilides, or take the word of an " infallible " sanitary officer. " In practice an elderly and conscientious colonial medical practitioner can distinguish at once and without any doubt a yaws

from a syphilitic lesion" (practica la quale permette ad un vecchio e coscienzioso medico coloniale di distinguere subito, senza incertezza un pianoma da un sifiloma). *H. H. S.*

HUDSON (Ellis H.). **Juxta-Articular Nodules in Euphrates Arabs.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. Mar. 8. Vol. 28. No. 5. pp. 511–522. With 4 figs. on 2 plates. [42 refs.]

An interesting article reporting eight cases of J.A.N. among Arabs of the Middle Euphrates region and the pathological findings in one of these cases.

Of 236 unselected Bedouin males admitted consecutively to the clinic during 8 months, five or 2·1 per cent. manifested these lesions, recognized by the local name "*rih.*" Of 8 cases described, six were male Bedouins, one a female Bedouin, one a townsman. All yielded positive W.R. and all gave a previous history of "*bejel*," the endemic native syphilis, from which 90 per cent. of the nomads and 40 per cent. of the townspeople suffer.

The author believes the lesions in his cases to differ in no way either clinically or pathologically from those described in cases of yaws and more rarely in cases of syphilis. *H. S. S.*

WOLF (Max). Zur Kenntnis der juxta-artikulären Knoten. [**A Case of J.A.N.**]—*Wien. Klin. Woch.* 1934. Nov. 23. Vol. 47. No. 47. pp. 1420–1422. With 2 figs. [15 refs.]

A report on a case of J.A.N. in a 34-year-old male syphilitic in Vienna.

The patient had lived in the province of Corrientes, South America during 1926–27, returning to Europe in May 1927. In August the same year he developed a spirochaete positive chancre and later the W.R. was positive. Courses of treatment with arsenic and bismuth were given during 1927 and 1928.

The J.A.N. lesions appeared in 1928, *i.e.*, while under treatment, on the index finger of the right hand and in the left hand in 1931. There were altogether nine nodules symmetrically situated on each hand and fingers and there was a syphilitic bursitis over the olecranon. The nodules were partly attached to the deep surface of the skin but moveable over the deeper tissues. They gave to the skin stretched over them a yellowish colour. There was no interference with joint movements. The largest was the size of a cherry; in some there was a suggestion of softening but in none did the skin break down. In 1931 the patient sought relief; 5 injections of salvarsan and 8 of bismuth were followed by retrogression of the nodes.

The author suggests that the special localization was due to the man constantly driving a motor car. The histological picture he thinks suggests a syphilitic lesion but spirochaetes were not demonstrated.

H. S. S.

HACKETT (C. J.). **Interstitial Keratitis, Boomerang Legs and Yaws in a European Boy from the New Hebrides.**—*Med. Jl. Australia.* 1935. Aug. 17. 22nd Year. Vol. 2. No. 7. pp. 213–216. [21 refs.]

A boy aged 14 was brought for treatment in Australia suffering from blepharospasm, swelling of the lid and ciliary congestion of right eye in

1933. The cornea was hazy, the iris swollen and vascularized and a small hypopyon was present. This was followed after a few weeks by affection of the left eye. The condition was considered to be one of interstitial keratitis. Further clinical examination revealed bilateral "boomerang tibia" it was believed of 5 years' duration and a little subcutaneous nodule on one wrist followed by the appearance of a nodule on the other wrist.

"Both tibiae showed swelling anteriorly (with the maximum point just above the middle of each bone) which gave the impression of forward bowing. There was slight lateral swelling. The anterior tibial crest was rounded." There was an increase in the antero-posterior diameter in the middle third. This was confirmed by radiological examination and the report stated that the condition was "suggestive of specific periostitis." Under treatment with N.A.B., etc., the eye condition subsided and the nodules disappeared. The blood W.R. was positive; the C.S.F. was normal.

The author suggests that it is only reasonable to suppose that the interstitial keratitis and the sabre tibiae were due to the same cause—either congenital syphilis or yaws, and believes that the latter is the more likely.

The boy had lived in the New Hebrides, where yaws is common and syphilis *said* to be absent, from birth to the age of 2½ years and again from the age of 5–7½ years. The rest of his life including the last 6 years was passed in Australia. But beyond having had some sores about the ankles as a child, sores which occur in all the children, and an abscess of uncertain nature in the right thigh in 1928 before the appearance of the tibial condition, there was no history of yaws.

Against the condition being due to congenital syphilis was the fact that the father and two brothers gave negative W.R. and the history of the mother's 6 previous pregnancies. It is also pointed out that interstitial keratitis has been previously by other writers ascribed to yaws. *H. S. S.*

Montestruc (E.). Un cas de goundou à la Martinique. [**A Case of Goundou in Martinique.**]—*Bull. Soc. Path. Exot.* 1934. Oct. 10. Vol. 27. No. 8. pp. 770–771.

A case of goundou in a 23-year-old Martinique male seen at Fort-de-France.

Beginning 2 months before, on examination there were symmetrical paranasal bony hard tumours the size of small hazel nuts. No other signs nor symptoms, no bony deformities elsewhere; no history of yaws or syphilis (Vernes péréthynol: 0); no history of nasal discharge.

This is the first case to be reported from the French Antilles though Branch reported a case from St. Vincent, an adjoining island. In both, yaws and syphilis are endemic. The author believes it is a disease independent of yaws. *H. S. S.*

Walker (J.) & Mathieu (V.). Contribution à la question du pian et des rhumatismes pianiques en particulier dans le Ruanda-Urundi. [**Yaws and Rheumatism in Ruanda-Urundi.**]—*Ann. Soc. Belge de Méd. Trop.* 1935. Mar. 31. Vol. 15. No. 1. pp. 119–125.

An attempt to correlate the rheumatism so common among the natives of Ruanda-Urundi, as elsewhere in Africa, with latent yaws.

The authors believe that syphilis, and therefore congenital syphilis, is rare among this native population, basing their belief upon the fact that among 7,000 persons examined in 1933, in only 22 was there a penile lesion of possibly syphilitic nature, and that of these in only 16 was the *Sp. pallida* demonstrated. [Reasoning open to fallacy.]

They therefore assume that positive serum reactions are due to yaws in the vast proportion of cases and that syphilis may be neglected.

In attempting to find the percentage of the population with latent yaws, Wassermann and Meinicke reactions were carried out upon 174 adult persons who had no history of yaws, who had no sign of yaws and who had no other disease likely to influence the reactions.

In 119 or 68·4 per cent. both reactions were negative and these cases were considered to be clearly "indemnes de pian." Twenty other cases or 11·5 per cent., in which the reactions were doubtful were considered non-framboesial.

The remaining 35 or 21 per cent. were believed to be cases which should be looked upon as cases of latent yaws. In regard to rheumatism or "douleurs rhumatoïdes" 446 adults were selected, complaining of this symptom but exhibiting no signs of yaws, and their serum reactions carried out. In 47·1 per cent. the reactions were completely negative, in 34·1 per cent. positive and in others partly positive so that it was considered that half the cases of rheumatism were of framboesial origin. [A suggestion that may be true but is not proved as the authors seem to agree later.]

To account for the high figure of 21 per cent. latent infections, *i.e.*, persons with no history, sign or symptom of yaws the authors believe they have good grounds for suggesting that the number of infections in childhood which are benign and undergo spontaneous cure leaving no trace behind them, except the positive serum reaction, is much greater than is generally believed. *H. S. S.*

HASSELMANN (C. M.). **Fatality from Exacerbation of Latent Tuberculosis due to Thio-Bismol in a Case of Yaws.**—*Arch. Dermat. & Syph.* 1935. May. Vol. 31. No. 5. pp. 686–691. With 1 fig. [17 refs.]

A case of yaws in which death followed upon the injection of bismuth.

A child aged 9 years suffering from florid yaws but otherwise apparently in good health was given 3 intramuscular injections, 3 days intervening between the treatments. The first injection consisted of bismuth hydroxide dispersed in oil, the second of a 10 per cent. suspension of bismuth salicylate in oil, these two together being equivalent to 0·248 gm. bismuth. The third injection consisted of 0·2 gm. thio-bismol containing 0·075 gm. bismuth. Two days later fever and scanty urine were noted and death occurred on the 6th day after the last injection. Post-mortem examination revealed a fatty congested liver, tubular nephrosis and fibrocaseous pulmonary tuberculosis.

The author points to the danger which is likely to follow upon the fashion to overemphasize the efficacy and harmlessness of the various bismuth preparations in the treatment of yaws and syphilis. He holds that there is "no direct need for combining arsphenamine with bismuth" and believes, with LESSER, HUDELO and RABUT, STOKES and others, that the action of bismuth is one of inhibition and not destruction of the treponeme. "It is high time and quite necessary to draw attention to the mostly transient and rather inconstant effects on the

malady on the one hand and the increasing number of toxic side-effects on the other." Bismuth is far inferior to arsphenamine but if it is used then oily preparations are to be preferred to water soluble compounds. Attention is drawn to the particular liability of bismuth to awaken and cause exacerbation of tuberculous lesions. *H. S. S.*

COUTINHO (Arthur). Um novo medicamento no tratamento da bouba. [**A New Drug for Treatment of Yaws.**]—*Ann. Paulist. Med. e Cirurg.* 1934. Dec. Vol. 28. No. 6. pp. 555–559. With 2 figs.

Vanadium like bismuth and arsenic has been used in the treatment of syphilis but its toxicity was greater than that of the two latter. Recently Professor PEREIRA has introduced a newer compound called Tarvan, sodium vanadium tartrate, in the treatment of syphilis, which combines a marked spirochaeticidal action with diminished toxicity.

This preparation has now been tried out in Brazil by the author on two cases of florid yaws. Six intramuscular injections in one case, three in the other, at 3–4 days intervals, the dose being 2 cc. of a 7·5 per cent. solution, caused complete disappearance of the yaws eruption and cessation of bone pains and headache, the only unpleasant symptom being nausea following the earlier doses.

The author states that the cost is low and is persuaded that it is a most efficacious remedy. Spirochaetes disappeared from lesions in 48 hours after the first injection. [The " blanchissement " obtained in these two cases would appear to be insufficient grounds upon which to base an opinion of much value. No mention is made of Wassermann reaction.] *H. S. S.*

WILSON (Paul W.). **Incidence of Yaws and Syphilis in Five Rural Villages, Republic of Panama.**—*U.S. Nav. Med. Bull.* 1934. Oct. Vol. 32. No. 4. pp. 391–401.

A report upon the study of the incidence of yaws and syphilis in villages near Panama City.

A large part of the paper is taken up with serological reactions presented in the form of tables which cannot be summarized, the rest deals with individual cases which need not be reproduced.

J.A.N. were found in 10 per cent. of the yaws cases and it is called to mind that in Haiti the figure was only 0·42. *H. S. S.*

LAFLEUR. Contribution à l'étude des croyances des indigènes de la haute Sangha au sujet du pian.—*Ann. de Méd. et de Pharm. Colon.* 1934. Oct.–Nov.–Dec. Vol. 32. No. 4. pp. 574–579.

MEMORSKIJ (W.). Nodositas juxtaarticularis ohne Syphilis.—*Arch. Dermat. u. Syph.* 1935. Aug. 14. Vol. 171. No. 6. pp. 610–611.

NÄGELSBACH (E.). Myorezidiv bei Frambösie.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1935. Mar. Vol. 39. No. 3. pp. 125–126.

TROPICAL OPHTHALMOLOGY.

A Review of Recent Articles. XXIV.*

Conjunctiva.—Saradindu Sanyal[1] has isolated Gram positive cocci in plasma cells obtained from cases of the epidemic conjunctivitis and keratitis met with in Calcutta during recent years. These cocci are also found in the epithelial cells and may be seen lying free in the sub-epithelial connective tissues.

Trachoma.—Slight ptosis which gives the patient a sleepy appearance is a constant early sign in the first stage of trachoma. Busacca[2] attributes this to the increased weight of the lid caused by the oedema associated with the inflammation in the upper fornix and disagrees with Falta's theory that it may be due to an involvement of the tarsal muscle in the inflammation.

Wright[3] has contributed an important paper regarding the disease in which he states that, working in conjunction with Dr. C. G. Pundit and the staff of the King Institute, a virus has been isolated on the allantoid membrane of the chick from cases of undoubted trachoma. The virus is filtrable and the filtrates reproduce similar lesions on the allantoid membrane. Hitherto, however, attempts to reproduce the disease in the human subject by implantation of the virus have been unsuccessful. The author deplores the obstacle to research presented by the difficulty clinicians experience in deciding what constitutes true trachoma. He believes that it is a specific disease entity and that the development of cicatricial tissue is one of its outstanding features; this is, however, an extremely variable feature and cannot alone be used by experimentalists as a criterion of trachoma. The extraordinarily heavy incidence of the disease amongst the Sikh and other regiments stationed in the Punjab and North-West Provinces described in the report of the Public Health Commissioner with the Government of India is referred to with some scepticism, and the value of Wilson's sign is contested. The whole problem of the disease is compared to that of dysentery which at one time was regarded as a single disease entity and is now differentiated into a number of varieties. A much needed warning is given against the too strenuous treatment by caustics of conjunctival disorders which would be likely to recover if subjected to a mild and harmless drug treatment with lavage. Meighan[4] has described the measures taken in Glasgow where the disease is a notifiable one. At the end of 1934 there were 120 cases on the register, but 13 of these were doubtful. During the year there were 17 notifications and 7 of these had definite trachoma. There is a central dispensary where a surgeon diagnoses and treats the cases whilst a nurse visits the homes and keeps contacts under observation and carries out treatment.

---

* For the twenty-third of this series see Vol. 32, pp. 471–478.

[1] Sanyal (Saradindu). A Preliminary Report on the Bacteriology of Kerato Conjunctivitis with Adenitis seen in Calcutta.—*Calcutta Med. Jl.* 1935. May. Vol. 29. No. 11. pp. 621–622. With 1 plate.

[2] Busacca (Archimède). A propos d'une remarque de M. Falta sur mon article "Ptosi transitorie e ptosi permanenti nel tracoma."—*Rev. Internat. du Trachome.* 1935. July. Vol. 12. No. 3. pp. 166–168.

[3] Wright (R. E.). The Trachoma Problem.—*Brit. Jl. Ophthalm.* 1935. June. Vol. 19. No. 6. pp. 309–318.

[4] Meighan (S. Spence). Trachoma in Glasgow.—*Brit. Jl. Ophthalm.* 1935. June. Vol. 19. No. 6. p. 326.

Fifty-nine per cent. of the patients were under fifteen years old. ROQUES[5] advocates the application of formol in the treatment of the disease. The drug is applied to the everted lid after thorough cocainization and drying of the membrane. A moistened swab is kept in contact with the conjunctiva for a minute and this is followed by an abundant irrigation with distilled water. A five per cent. solution appears to have given the best result. MACCALLAN[6] has discussed some aspects of trachoma. He defines the disease as " a specific contagious disease of the conjunctiva characterized by the new formation of lymphoid tissue which spreads to the cornea. It is followed by cicatricial changes in the affected tissues. It is chronic in nature." The aetiology is uncertain and the presence or absence of inclusion bodies is not of diagnostic significance. He believes that the experimental conjunctivitis produced in monkeys by the inoculation of trachomatous tissue is true trachoma despite the fact that the cornea remains free from invasion. No reference is made to Noguchi's *Bact. granulosis*. The epidemics of acute conjunctivitis which occur in trachomatous countries and are responsible for the high incidence of blindness therein add to the aetiological difficulties. These ophthalmias complicating trachoma are responsible for the heavy incidence of blindness in some countries. In the great majority of countries where trachoma is endemic, however, the disease begins insidiously and pursues a chronic course. Infection in childhood is mostly familial, but may result from a mass infection in a boarding school. The issue of simple eyedrops by the Government for use as a prophylactic in badly affected countries might be of service. It is stated that in some parts of Northern India trachoma is practically universal, but progresses to a quiescent stage which produces little disability. [This seems to be an exaggerated estimate if the author's definition of the disease is accepted.] HERBERT[7] has commented on BUSACCA's description of the microscopical features of " Herbert's Pits " (*ante*, p. 472). He suggests that the epithelial crypts found at the limbus in some eyes induce a lymph stasis in their neighbourhood which favours the accumulation of wandering cells. In trachomatous infection erosion of the corneal lamellae occurs and pitting results. In his Indian experience there was but little indication of any epithelial proliferation in the pits ; possibly this was due to lack of treatment and absence of any epithelial stimulant. The experience in Lithuania of AVIZONIS[8] is distinctly unfavourable to the theory that trachoma and pterygium are mutually antagonistic. He has, indeed, found that trachoma may, if anything, render a person more susceptible to the growth.

CULLOM[9] has described some of his trachoma experiences. These show that trachoma is a transmissible disease carried by infectious secretion from one eye to another. He thinks, too, that this secretion

---

[5] ROQUES (Henry). Nouveau traitement chimique du trachome.—*Gaz. hebd. Sci. Méd. de Bordeaux*. 1935. Mar. 31. Vol. 56. No. 13. pp. 198–200.

[6] MACCALLAN (A. F.). Trachoma—Recent Advances and the Principles of Prophylaxis.—*Brit. Jl. Ophthalm.* 1935. May. Vol. 19. No. 5. pp. 253–260.

[7] HERBERT (H.). Corneal Pitting.—*Brit. Jl. Ophthalm.* 1935. May. Vol. 19. No. 5. pp. 261–264.

[8] AVIZONIS (P.). Le pterygion et le trachome.—*Rev. Internat. du Trachome*. 1935. Apr. Vol. 12. No. 2. pp. 97–98.

[9] CULLOM (M. M.). Trachoma Infection and Treatment.—*Southern Med. Jl.* 1935. July. Vol. 28. No. 7. pp. 642–645.

may cause a very violent reaction. If the infection is feeble and ordinary cleanliness is observed, chances of contagion are slight. The disease is a filth disease due to the indiscriminate common use of towels and wash-basins. He is rather sceptical of the statement that pannus occurs independently of the rough surface of the lid and thinks the obvious explanation is that it is a traumatic injury to the cornea which causes abrasion and ulceration of the epithelial layer. He stresses the importance of attending to any malnutrition which may be present.

As the result of laboratory work at Giza, STEWART[10] has put forward the hypothesis that the granular virus of trachoma is introduced into the conjunctiva in the bodies of bacteria of several species. These bacteria, acting as intermediate hosts, are phagocytosed to form the Prowazek-Halberstaedter bodies. The granules of the virus are liberated by the bursting of the inclusions and are then dispersed through the conjunctiva. Prowazek-Halberstaedter bodies are not found in pure, uncomplicated trachoma, but only in trachoma complicated by bacterial infection, especially the Koch-Weeks bacillus and the gonococcus.

VON SZILY[11] found that he was able to induce a follicle formation in the uvea and other ocular and orbital tissues by inoculating material obtained from a case of sympathetic ophthalmitis. This led him to experiment with trachomatous matter in a similar fashion. The matter was ground in a mortar with saline and the emulsion injected into the vitreous of a rabbit after having punctured the anterior chamber. Many of the experiments were negative ; but in some he was successful in inducing a typical follicle formation. He suggests that some ultra-microscopic organisms may exist which have the property of bringing about follicle formation. SÉDAN[12] has reported three cases which he believes to have been trachomatous and in which a relapse of the conjunctival inflammation occurred during an attack of hay-fever, bronchitis and influenza in the respective patients. PADOVANI[13] expresses himself satisfied with the use of taurocholate of soda in the treatment of pannus and quotes two of his cases as evidence. The fact that the drug is capable of inducing lysis of certain bacteria *in vitro* suggested its employment. He used a solution of 10 per cent. to paint the anaesthetized conjunctiva ; but he recommends a weaker solution of 3 per cent. as an instillation if corneal ulceration is present.

JOURDRAN[14] has reported from Tonkin seven cases of trachoma which he claims to have cured completely within a remarkably short period by the use of high frequency fulguration. The operation is only slightly painful ; it induces a rather marked oedema which gradually disappears.

---

[10] STEWART (F. H.). Recent Advances in Trachoma.—*Brit. Med. Jl.* 1935. June 22. pp. 1261–1262. [15 refs.]

[11] VON SZILY (A.). Uebertragungsversuche mit Trachommaterial. Ein Weiterer Beitrag zur Kenntnis follikelbildender Erreger.—*Klin. Monat. f. Augenheilkunde.* 1935. Jan. Vol. 94. pp. 1–11. With 21 figs.

[12] SÉDAN (Jean). Trois cas de trachome " saisonnier."—*Rev. Internat. du Trachome.* 1935. Apr. Vol. 12. No. 2. pp. 91–94.

[13] PADOVANI (S.). De l'action favorable du taurocholate de soude dans le trachome. (A propos de l'hypothèse du rôle étiologique des inclusions.)—*Rev. Internat. du Trachome.* 1935. Apr. Vol. 12. No. 2. pp. 94–97.

[14] JOURDRAN. Contribution à la thérapeutique du trachome par l'étincelle froide de haute fréquence (courants de tension, fulguration monopolaire).—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 2. pp. 523–527.

Cornea.—WRIGHT[15] has reported two cases of *corneal grafting* which show that large corneal grafts are just as likely to be successful as small ones and that an eye blind from glaucoma constitutes a good donor eye. Anterior synechiae can be dealt with successfully and the chamber reformed by performing a preliminary operation. One of the patients had trachoma with pannus and a corneal ulcer and the other had suffered from a syphilitic interstitial keratitis. The larger graft was 9 mm. in diameter.

Cataract.—HOUWER & MINGELEN[16] believe that in the tropics infra-red rays play an important part in the aetiology of senile cataract. Other factors, too, are of course present. Heredity, endocrine disorders, autointoxication and senility are instances. They base their conclusions on the fact that they have found a high incidence of " furnace workers' cataract " in Java amongst people who have never been exposed to a furnace glare. The proportion of Europeans affected by glassblowers' cataract was greater than that of the natives of Java.

Glaucoma.—ELLIOT[17] has reviewed some of his experiences in connexion with his operation for glaucoma. He warns the surgeon against dragging uveal tissue into the trephine hole ; this can be avoided if the trephined disc and the bulging iris are seized with one grip of the forceps and cut together with one snip of the scissors. He advocates a small peripheral iridectomy and uses a continuous suture to unite the edges of the conjunctival flap, passing the thread over iodine before and after each penetration of the conjunctival edges. Impaction of uveal tissue which blocks the trephine hole and stops filtration may prove difficult to deal with. Recently he has been successful in treating such a case by passing a Ziegler's knife subconjunctivally and dividing the tissue with a sweep of the knife. Detachment of the choroid may occasionally occur after trephining. It is unnecessary to keep patients with this complication in the recumbent position. The main point in post-operative treatment is to ensure that the pupil remains wide. Massage after trephining is of great value. Should it prove necessary to remove the lens for cataract after trephining has been performed, care should be taken to avoid involving the trephine aperture in the incision and to make the conjunctival flap in an area free from filtration.

Mycosis.—LANGERON[18] has reported a case of ocular mycosis. One eye only was affected. In the upper quadrant of the cornea and involving the neighbouring conjunctiva lay a pea-sized nodule surrounded by an area of infiltration. The surface showed three small yellowish pustules, the largest of which lay on the corneal aspect and was breaking down. A yellowish ulcer the size of a lentil was seen on the upper tarsal conjunctiva, whilst small rounded greyish-yellow raised spots covered the upper cul-de-sac. The changes were limited to the upper lid. The glands were swollen, but freely moveable and not painful. Febrile reaction was absent. A fungus of the *Beauveria* type was isolated from the lesion ; the author has named it *B. brumpti.*

[15] WRIGHT (R. E.). Corneal Grafting. Reparative and Optical.—*Brit. Jl. Ophthalm.* 1935. June. Vol. 19. No. 6. pp. 341–347. With 1 fig.

[16] HOUWER (A. W. Mulock) & MINGELEN (R.). Cataracta Tropica.—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 2. pp. 509–513.

[17] ELLIOT (R. H.). Some Points in Connexion with Sclerocorneal Trephining.—*Brit. Med. Jl.* 1935. Aug. 24. pp. 334–335.

[18] LANGERON (Maurice). Mycose oculaire primitive due au " Beauveria brumpti." —*Bull. Acad. Méd.* 1934. Jan. 23. 98th Year. 3rd Ser, Vol. 111. No. 3. pp. 133–137.

Onchocerciasis.—Joyeux, Sédan & Esmenard[19] have reported a case of ocular onchocerciasis in a European who had been on the Ivory Coast in French Western Africa for a little over a year. The patient had a subcutaneous nodule over his left shoulder-blade from which it was possible to obtain a dead *O. volvulus*. There were numerous small granulomata under the conjunctiva, but no microfilariae were found in these.

Cohen[20] has described a sign which is present in the early stage of a paralysis of the facial nerve. If the normal person is asked to look upwards whilst keeping the eyes closed the action of the *levator palpebrae superioris* is masked by the contraction of the *orbicularis* ; but if there be any weakness of the latter muscle the eye opens on looking upwards owing to the feeble action of the *orbicularis*. (This may prove a valuable sign in the early stages of leprosy.)

Retinitis pigmentosa.—Many forms of treatment have from time to time been employed in attempts to alleviate this condition. Macdonald & McKenzie[21] have been unable whole-heartedly to confirm Royle's successful results by the performance of a sympathectomy. Their experience was limited to four cases ; one of these regressed, one remained unaltered, and the other two showed a slight improvement. The authors suggest that to have a fair chance the operation should be performed in the very early stages of the disease.

Quinine amblyopia.—Wolff[22] investigating the causes of *quinine amblyopia*, points out that quinine interferes with the oxidation of the tissues. This oxygen lack causes a spasm of the retinal artery and leads to the changes associated with quinine poisoning. He thinks that two stages may be distinguished in the action of the drug. In the first the quinine in its capacity as a general protoplasmic poison acts directly on the retinal elements, and the second stage depends on the spasm of the retinal vessels and is probably acute in onset.

The Twenty-first Annual Report of the Ophthalmic Section of the Government of Egypt for the year 1933 records the continuous progress made in the fight against diseases of the eye in that country. The statistics deal with the diseases seen in the enormous number of 825,304 new patients, an increase of 15 per cent. compared with the previous year. 6·4 per cent. of the total were found to be blind in one or in both eyes and 80 per cent. of this blindness was caused by acute ophthalmia. Nearly half the acute ophthalmias were due to the gonococcus. 10,066 primary school-children were examined and it is stated that the appalling proportion of 98 per cent. was affected by trachoma in some form. 59,670 cases of trichiasis were seen amongst the new out-patients, and 8,533 cases of chronic dacryocystitis. Trachoma accounted for 761,289 admissions. Cases of primary chronic glaucoma (6,223) considerably out-number those of senile cataract (4,655) ; this incidence differs from that found in most tropical countries and the cause of it is worthy of investigation. *H. Kirkpatrick.*

---

[19] Joyeux (Ch.), Sédan (J.) & Esmenard (J.). Un cas d'onchocercose contractée à la Côte d'Ivoire, avec complications oculaires.—*Bull. Soc. Path. Exot.* 1935. June 12. Vol. 28. No. 6. pp. 435–438.

[20] Cohen (Henry). An Early Ocular Sign in Facial Paresis.—*Brit. Jl. Ophthalm.* 1935. May. Vol. 19. No. 5. p. 267.

[21] Macdonald (Alexander E.) & McKenzie (Kenneth G.). Sympathectomy for Retinitis Pigmentosa.—*Arch. Ophthalm.* 1935. Mar. Vol. 14. No. 3. pp. 362–373. With 6 figs.

[22] Wolff (Eugene). The Causation of Quinine Blindness.—*Lancet.* 1935. June 29. pp. 1497–1498. [14 refs.]

MISCELLANEOUS.

EGYPT, MINISTRY OF THE INTERIOR. DEPARTMENT OF PUBLIC HEALTH. **The Research Institute and the Endemic Diseases Hospital. Third Annual Report 1933.**—108 pp. With 7 sketch maps, 3 graphs & 7 figs. on 4 plates. 1934. Cairo : Government Press, Bulâq.

This report, which is published over the signature of the Director (Dr. M. KHALIL), details the work carried out by the staff of the Institute and the Hospital, which includes a biochemist, a protozoologist, an entomologist, a malarial officer and four physicians.

The report is divided into Scientific and Clinical Sections, the former dealing with the work of the specialists and the latter detailing much interesting work on the anaemias, schistosomiasis, hepato-splenomegaly, malaria, ancylostomiasis, pellagra and dysentery. Attention is called to the rarity of pernicious anaemia in Egyptians, though parasitic anaemias are common ; of over a hundred cases of achlorhydric anaemia not one was found to be macrocytic in type.

The observers express dissatisfaction with the accuracy of the halometer which in their hands gave 20 per cent. of errors and has been given up in favour of the Price-Jones curve and measurement of the volume index. A few observations were made on Archibald's claim regarding the lethal effects of *Balanitis aegyptiaca* on disease-carrying molluscs. Their results show that *Planorbis* and *Bulinus* are killed by a 1 in 10,000 solution of the berries in 48 hours, but the experiment deserves to be repeated on a scale more worthy of its importance. The tree is not, however, indigenous to northern Egypt.

Oriental sore is shown to be common in certain villages and a survey of five of these with a total population of 1,400 revealed no less than 232 persons with active sores and 341 healed ones.

Phlebotomus papatasii is the common sand-fly.

The part devoted to malaria is full and interesting but is too long to be summarized here.

An analysis of the infections amongst patients attending the helminthological clinic shows that about half (6,877 out of 12,804) suffered from urinary schistosomiasis whilst only about 2 per cent. harboured the intestinal worm (*S. mansoni*).

Fouadin was used for treatment and of those who received the full course of nine injections 83 per cent. were cured and on the re-examination of 480 patients a month later 87 per cent were still negative.

Ancylostomiasis was the second most common worm infection and was treated by 5 cc. doses of carbon tetrachloride with results which varied according to the number of treatments given ; 58 per cent cured after one treatment, 73 after two, 93 after three and all after four treatments.

The Clinical Section deals with investigations on in-patients who offer better opportunity for thorough and exact observation.

The study of helminthic anaemias is of particular interest ; it is noted that severe grades are produced by ancylostomes and intestinal schistosomes, moderate grades by urinary schistosomes and by ascarids whilst the other helminths do not produce any anaemia (*T. saginata* is the only tape-worm referred to).

The degree of eosinophilia bears no relation to the intensity of the worm infection but is dependent on the condition of the host, and in the

same way the severity of the anaemia bears no direct ratio to the number of the worms, but here again it is the human reaction which is the determining factor. A rise in the eosinophile count is indicative of a good response to treatment just as is a rise in the reticulocyte count.

The observers emphasize that the type of anaemia common to helminthic infection is " hypochromic, micro- or normocytic, non-haemolytic, hypoplastic anaemia with eosinophilia."

Such cases derive no benefit from massive liver treatment but respond to large doses of iron.

The disease hepato-splenomegaly is of particular interest and there is much in the report concerning its nature. These observations were made on 103 cases, of which 67 were associated with intestinal schistosomes and 23 with the urinary infection. They emphasize the fact that a number of other conditions must be excluded (*e.g.*, syphilis, malaria, leishmaniasis, Hodgkin's disease, Gaucher's disease, etc.) before a diagnosis of Egyptian splenomegaly can be arrived at. The bilharzia cutaneous reaction has been used and the observers regard a negative reaction as strong evidence against infection, whereas, in a highly infected country like Egypt, a positive reaction is of less value in that it does not distinguish between a recent and a past infection.

It is satisfactory to feel that such good use is being made of the unrivalled clinical material in Northern Egypt and we look forward to further reports and hope that they will include summaries of those researches which in the present publication are incomplete.

F. P. Mackie.

CAVALADE. Rapport sur une tournée effectuée dans la région de Niamey (Niger) par le groupe mobile d'hygiène en juin-juillet 1933. [**Account of a Tour in Niamey (Niger) District.**]—*Ann. de Méd. et de Pharm. Colon.* 1935. Apr.–May–June. Vol. 33. No. 2. pp. 363–384. With 1 map.

This is a report of a tour of inspection carried out from Niamey to Kouré, Birni, Yeni, Tondigandia, Damana, Filingué in Upper Volta and back during 5 weeks, June 24th–July 29th, 1933. Mention is made of the chief diseases observed, but for want of a microscope accurate diagnosis was at times not possible. *Dysentery* was frequent, in fact was general except at Kouré ; the riverain populations are heavily infected. Much appears to be amoebic, judged by the success of emetine treatment ; other forms were thought to be due to schistosomes or balantidium, not to bacilli [the need of a microscope must have been great here]. *Malaria* is present and splenic enlargement was observed in 58 out of 140 children examined, 41 per cent. A febrile condition, locally termed " hémarizé " or millet fever occurs in the rainy season at the time of maturing and gathering of the millet crop. Its symptoms are characterized by sudden onset of fever with intense headache, and bilious vomiting, at times uncontrollable, and ending fatally in 2 days or so. In the majority, however, there is remission on the third day for 24–72 hours, then a return of symptoms but to a less degree. The debility is marked, but recovery takes place in 8–15 days. If there is any immunity produced it is not lasting for the patient may be attacked again the following year. As stated, if remission does not set in by the third day the fatality rate is high ; on the other hand death is rare after a remission. The disease is not

epidemic ; all the cases are sporadic. There is no jaundice ; blood smears gave no clue ; the absence of jaundice, of immunity and of epidemicity and the early death in fatal cases eliminate yellow fever. There is no rash, as of dengue. Another form of fever occurs with jaundice, epistaxis, and vomiting with blood which may be Weil's disease.

Measles is an important cause of death ; *tuberculosis* not uncommon, usually of slow evolution, but in more rapid cases haemoptysis occurs. Gonorrhoea is said to be common, but gonococcal ophthalmia is rare among infants and almost any patient suffering from painful micturition was put down as a case of gonorrhoea ; many were in all probaability suffering from *Schistosoma haematobium*. *Leprosy* and *syphilis* were both met with but only " moderately widespread " [no figures of prevalence are given]. *Dracontiasis* was rife, especially in the Canton of Kourfei.

[Further study of the diseases of this region might yield interesting information, particularly if investigation was aided by the use of a microscope.] *H. H. S.*

GEAY (M.). Étude médicale de l'annexe de Géryville. [**Medical Study of the Annexe of Géryville.**]—*Arch. Inst. Pasteur d'Algérie.* 1935. Mar. Vol. 13. No. 1. pp. 72–119. With 1 map & 7 figs. on 5 plates.

The Annexe of Géryville, situate in South Oran, measures 450 km. from north to south and 200 from east to west. In the north it is high country, in the south it is desert. The town of Géryville, a well-watered spot, is in the northern part and contains about 3,780 people, in addition to the garrison ; its climate is temperate.

Among the principal diseases observed *syphilis* takes first place. Infection is generally not venereal but due to the crowded living conditions. Primary, secondary and tertiary manifestations are described, especially the last. Nerve symptoms are very rare. Abortions are frequent and the congenital disease is common at 4 to 10 years. There have been several outbreaks of *malaria*, especially in 1930–32. The anopheles, determined by EDWARDS, are *A. hispaniola* and *A. maculipennis*. The author himself has not seen any malaria, a testimony to the measures taken by his predecessors, which consisted in drainage and filling ; quininization of children is useless. May–October is the period when the vectors breed. *Typhus* is probably always present but is only evident when epidemic. The natives fear the French prophylactic measures and conceal their cases. Preventive measures must be promptly taken on suspicion ; laboratory evidence should not be waited for. Though it is usually benign, severe and fatal cases occur in the natives. A small epidemic in 1932 consisted of ten cases, all confirmed by Weil-Felix ; three were severe, with one death, five of moderate severity and two light. The characteristic rash was seen only three times. The author observed in 6 cases studied by him REMLINGER's tongue sign, viz., the patient is unable to put out his tongue which seems to cleave to the roof of the mouth. Two other signs which never failed were conjunctival infection and staggering ; the latter lasted into convalescence. Details of prophylactic measures are given. *Trachoma* is widespread. The proportion of infected children in the schools varies from 20 to 70 per cent., the last at Géryville itself, and in adults is not much less. Trachoma is, however, much less common

among the purely nomadic peoples. Since March 1932 the author has diagnosed 60 cases of *tuberculosis*, 22 of the lungs, 10 of the pleura, 14 of the bones and joints, 8 visceral, and 6 meningeal. An experiment is in progress with BCG vaccine. The author says that the Algerian native, infant as well as adult, tends to present grave forms of this infection. The author goes on to the *obstetrical service*, and notes the frequency with which the French doctor is called to deliveries in native families. Details are given of the sanitary organization of the Annexe.

A. G. B.

i. Taylor (H. W. Y.). **The Incidence of Certain Tropical Diseases in Moukden and the Surrounding Parts of South Manchuria.**—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 2. pp. 403–406.

ii. Hiyeda (Kentaro). **On the Distribution of Parasites and Parasitic Diseases in Manchuria.**—*Ibid.* pp. 557–562. With 3 charts.

i. An account of the tropical diseases seen at the Mukden Hospital from 1929–1933, from a population of 16 to 20 millions.

The temperature varies from 39°C. in the shade in July to −25°C. in January. A table records the diseases with number of cases, proportion, and whether indigenous or not. The list is easily headed by trachoma which provided over 6 per cent. of cases : a long way behind comes Hongkong foot, and then dysentery, both bacillary and amoebic, and benign tertian malaria. The diseases believed to be endemic are—malaria, kala azar, relapsing fever, trachoma, dysentery, typhoid, beriberi, Hongkong foot and tinea imbricata. No cholera or plague was seen. Leprosy is not serious and it is doubtfully indigenous.

ii. The information given has been published [see this *Bulletin*, *ante*, p. 509.] *A. G. B.*

Tao (S. M.). **The Place of Parasitology in the Medical Curriculum in China.**—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 2. pp. 563–570. [14 refs.]

A plea is made for the provision of a place in the curriculum of all medical schools in China for the teaching of parasitology and for the establishment of a post-graduate course in tropical diseases and parasitology by the Central Field Health Station in Nanking or in one of the better equipped research institutes or schools in China. China has suffered because the curriculum followed in her medical schools is based on that of Western lands, where parasitology bulks small. *A. G. B.*

Broughton-Alcock (W.). **Further Laboratory Observations on a Large Number of Pensioners who contracted Malaria and Enteric Fevers during the Great War and returned to Residence in England.** —*Jl. Trop. Med. & Hyg.* 1935. Mar. 15. Vol. 38. No. 6. pp. 65–66.

The observations here referred to are based on the examination of more than 50,000 troops returned to Great Britain after the War and suffering from infections contracted during their service. The author, who was Director, Central Laboratory, Ministry of Pensions, refers to a previous paper [see this *Bulletin*, Vol. 18, p. 95] and writes—"I can now with emphasis repeat that malarial parasites do not remain in war

cases beyond five years after return home." Indeed after 15 months parasites were rarely found. Of those detected 787 were *P. vivax*, 14 *P. falciparum* and 5 *P. malariae*. The introduction of the Tanret test for quinine in the urine of out-patient pensioners showed that 70 per cent. were not taking it. During the year 1922 there were 46 per cent. positive Tanrets and 54 negative, so that " without being dogmatic " one may attribute recovery to home life in England and the development of immunity [? the dying out of the parasites].

In the first 5 post-war years only one enteric carrier, of *Bact. paratyphosum A*, was found and in the first 8 years only one of *Bact. typhosum*, showing that the body early rids itself of infection.

A. G. B.

BENAVIDES (Joaquin). **Comments and Procedure on Thick Blood Film Technic.**—*Jl. Lab. & Clin. Med.* 1934. Dec. Vol. 20. No. 3. pp. 289–295. With 2 figs.

This is a useful article describing the thick film method of blood examination for field survey work. The staining and dehaemoglobinization are carried out in blocks of 25 slides as recommended by BARBER. The article is full of practical detail and includes a very useful and simple method of preparing the Giemsa stain from Azur II eosin.

C. M. Wenyon.

PARDINA (Jose M.). Parasitosis intestinal infantil. [**Intestinal Parasitism in Children.**]—*Prensa Méd. Argentina.* 1935. May 29. Vol. 22. No. 22. pp. 1050–1062. [79 refs.]

This was a paper read at the Fifth Medical Congress, held at Rosario and dealing with the results of laboratory examinations of the faeces of children at the Hospital, Córdoba. Altogether specimens from 505 children were examined, and the large number of 360 were found positive, 71·2 per cent. ; 262 or 72·7 per cent. of those positive were passing protozoal parasites, one or more, 98 or 27·0 helminthic ova and 184 or 51 per cent. both. Of protozoa the commonest was *Giardia lamblia* in 116 or 32·2 per cent., *E. histolytica* (vegetative or cystic forms) 74 or 20·5 per cent. One hundred and sixty-one had one parasite only, 102 had more. Of the helminthic infestations Enterobius was the commonest, 31 or 8·6 per cent., *Hymenolepis nana* next, 24 or 6·6 per cent., then, in order, *T. saginata*, 13 or 3·6, Necator, 12 or 3·3, Ascaris and Trichuris, each 9 or 2·5 per cent. The majority of the patients showed no obvious symptoms as a result of the parasitism.

H. H. S.

SIMIN (N. A.). 19 Fälle von Coccidiosis bei Menschen. [**Nineteen Cases of Human Coccidiosis.**]—*Rev. Microbiol., Epidémiol. et Parasit.* 1934. Vol. 13. No. 2. [In Russian pp. 165–167. German summary p. 167.]

The author records 19 cases of human coccidiosis (*Isospora hominis*) from Abkhasia, in Transcaucasia, found in 1931–1932. In every instance the identity of the oöcysts discovered in the stools was confirmed morphologically, by cultivation (sporulation) and by animal experiments (which were negative). In the majority of cases (13) subjective complaints and intestinal disorder were present. In several out-patients the oöcysts could be recovered in the course of four months.

C. A. Hoare.

Redaelli (P.) & Ciferri (R.). Affinité entre les agents de l'histoplasmose humaine, du farcin équin et d'une mycose spontanée des muridés. [**Systemic Relations between Human Histoplasmosis, Epizootic Lymphangitis and Cryptococcus of Mice.**]—*Boll. Sezione Ital., Soc. Internaz. di Microbiologia.* Milan. 1934. Oct. Vol. 6. No. 10. pp. 376–379.

Discussing the systematic position of *Histoplasma capsulatum*, the authors conclude that the causative organism of epizootic lymphangitis of horses (*Cryptococcus farciminosus*) and *Cryptococcus muris* of mice are closely related to it and actually belong to the same genus, their names becoming *Histoplasma farciminosum* and *Histoplasma muris* respectively. The family Histoplasmaceae is one of the three subdivisions of the super-family Adelosaccharomycetaceae of Guilliermond which includes all the asporogenous fungi. *C. M. Wenyon.*

Chabrillat. Note sur la fièvre de trois jours. [**Three Day Fever.**]—*Bull. Soc. Path. Exot.* 1934. Oct. 10. Vol. 27. No. 8. pp. 762–766.

A French man-of-war was in harbour and dry dock in Madagascar on a cruise to Bombay, Calcutta and Aden ; while in harbour but also during the cruise many cases of a 3 day fever occurred, with severe headache and backache, no rash, the cases resembling sand-fly fever rather than dengue.

The cases occurred as follows :—

14th March to 8th May 1931	... ...	73 cases.
23rd December to 4th February 1932	...	15 ,,
17th March to 26th May 1932	... ...	40 ,,
Total	...	128 ,,

Eighty-five per cent. of the personnel were infected.

The interesting point is that in Madagascar there were few or no sand-flies and very numerous *Aëdes aegypti*. The few sand-flies disappeared within 24 hours of leaving harbour but the *Aëdes* remained and cases continued to occur. *D. Harvey.*

Mathew (R. Y.). **Interim Notes on an Outbreak of Coastal Fever at Tully, North Queensland.**—*Health.* Canberra. 1934. Aug. Vol. 12. No. 8. pp. 54–57.

Coastal fever has occurred in certain areas in North Queensland ever since the first settlers arrived there ; other names given to the disease are " scrub " fever, epidemic glandular fever, Mossman fever. The duration of the fever varies from 3 days to 3 weeks accompanied by a general enlargement of the superficial lymph glands ; a macular rash is frequently observed.

In 1934 some 30 cases of coastal fever occurred among workers in the cane sugar plantations at Tully in N. Queensland and were investigated by the writer of this paper. Seven people out of eight in one barrack room went down with the fever and some stated that they had had similar attacks in previous years.

Clinical notes.—The disease is characterized by a sudden onset with rigor, severe headache and backache and pain behind the eyes with

flushed face ; the fever lasted for 4 or 5 days but there was no characteristic saddle back temperature curve.

Laboratory notes.—Blood culture, blood films, agglutination tests with *Bact. typhosum* and *paratyphosum A*, *B*, *C* and *Proteus X19* and *XK* were all negative.

It is suggested that possibly the disease is either a form of leptospirosis or else a modified dengue. *D. Harvey.*

Scharles (F. H.) & Seastone (C. V.). **Haverhill Fever following Rat-Bite.**—*New England Jl. of Med.* 1934. Oct. 18. Vol. 211. No. 16. pp. 711–714. With 1 fig. & 1 chart. [13 refs.]

The description of a case of " Haverhill fever " in a medical student who was bitten by an albino rat. The bite was followed by a transitory lymphangitis, recurrent fever, associated with morbilliform rash and arthritis. Repeated blood cultures, dark field examinations of the blood, and injections of blood into mice and guineapigs were negative. Culture of the joint fluid yielded an organism which was identified as *Haverhillia multiformis* which is probably the same as *Streptobacillus multiformis*, described by Levaditi, Nicolau and Poincloux (1925).* The patient's serum agglutinated this organism in high titre.

E. Hindle.

Rhoads (C. P.) & Miller (D. K.). **The Association of Bartonella Bodies with Induced Anemia in the Dog.**—*Jl. Experim. Med.* 1935. Jan. 1. Vol. 61. No. 1. pp. 139–148. With 1 fig. & 1 plate. [11 refs.]

On feeding splenectomized dogs on a diet which produces black tongue there developed an anaemia associated with the presence of *Bartonella canis* in the red blood corpuscles. The addition of lean beef to the diet resulted in the appearance of reticulocytes and disappearance of the parasite. Blood from an animal showing *B. canis* injected into splenectomized dogs, produced a large infection, whereas no infection was produced by injection into normal dogs. *C. M. Wenyon.*

Magasin de Parasitologie de l'Institut Zoologique de l'Académie des Sciences de l'URSS. 1934. Vol. 4. pp. 1–367. Numerous figures and tables.

This issue of the *Magasin de Parasitologie* of Leningrad consists of fifteen contributions from various authors, of which nine at least are of interest to the medical entomologist, With one exception, which is in German, the papers are in Russian, but, again with one exception, are provided with German summaries. The titles given below are taken from the German Table of Contents, which follows that in Russian.

i. Guzewič (A. W.). Über die Stechmücken der Chibiner Berge. [**On the Mosquitoes of the Chibin Hills.**]—pp. 5–17. With 3 figs. and 4 tables.

Guzewič's paper deals with a collection of mosquitoes made during the years 1930–1932 in the vicinity of Chibinogorsk, in the Kola Peninsula. No Anopheles were encountered. The prevailing species was *Aëdes pullatus*, met with for the first time within the Arctic Circle,

* *C. R. Acad. Sci.*, Vol. 180, p. 1188.

more than 1,250 miles from Saratov on the Volga, its nearest hitherto-known locality. *A. pullatus* was found to breed in very small pools in the peat, fully exposed to the sun.

ii. Petrischtschewa (P. A.). Zur Biologie von *Anopheles bifurcatus* in Turkmenien. [**The Biology of *Anopheles bifurcatus* in Turkmenistan.**]—pp. 19–30. With 8 figs. & 4 tables & charts.

Although in Palestine breeding freely in rock-cisterns, the openings into which are sometimes actually inside houses, *Anopheles bifurcatus* in Turkmenistan (Transcaspia) is stated to enter dwellings and outhouses only exceptionally. Consequently, in spite of its wide distribution in the country, the species, as a potential vector of malaria, is of extremely limited and practically negligible importance.

iii. Martini (E.). Der Sowjetunion Bedeutung für das Problem der *Anopheles maculipennis*-Rassen. [**The Importance of the Soviet Union to the Racial Problem in *Anopheles maculipennis*.**]—pp. 31–42. With 3 figs.

Russia may ultimately shed fresh light on the racial question in *Anopheles maculipennis*. Accordingly Martini, in the only German paper in the collection, after stating the chief points, with especial reference to the races *atroparvus*, *labranchiae*, *typicus* (*maculipennis*) and *messeae*, with which readers of this *Bulletin* must be familiar, draws attention to some present-day problems, and remarks that hitherto all our knowledge has been obtained in Western Europe. On the other hand :—" The Soviet Union, with its enormous extent from north to south, offers a vast field for study, wherein perhaps quite different forms of eggs may occur." Russia, moreover, with its many foci of malaria, should afford grounds for important conclusions as to whether highly malarious conditions occur only within the area of a particular race of *A. maculipennis* or not. Similar valuable information might be obtained as to the influence of salinity and temperature of water in breeding places, and of climate and deviation by means of cattle.

iv. Beklemischew (W.), in co-operation with Schipizina (N.), Polowodowa (W.) & Nabokich (P.). Ueber die Genauigkeit der Abundanzbestimmung von *Anopheles maculipennis*-Larven in Pflanzenbewachsenen Gewässern. [**The Accuracy of the Determination of the Abundance of *Anopheles maculipennis* Larvae in Waters Rich in Vegetation.**] pp. 43–63. With 11 tables & 1 fig.

Again with reference to *A. maculipennis*, it is asserted by Beklemischew that every quantitative method of capture must be studied from two points of view, namely the percentage of the mosquito population, actually present, caught by the method employed, and the degree of accuracy possessed by the latter. The author, who used an ordinary gauze net and worked near Magnetogorsk, in the inundated region of the Ural River, takes as coefficient of productivity the percentage of the total number of larvae, at the moment of capture in the area under investigation, formed by those actually caught. By means of extrapolation it was found that the total number of larvae in a square metre of *Potamogeton pectinatus*, with an admixture of other plants (Ceratophyllum, Myriophyllum and *Lemna trisulca*), was 424. The coefficient of productivity of the first stroke of the net was 56·75 per cent. Four similar investigations, in growths of Canadian water-weed (Elodea), were carried out at different times and in different waters, when,

although larval abundance differed greatly in the four cases, the mean corresponding coefficient proved to be 54·6 per cent. Although the regularity of their distribution varies in different plant-communities, the larvae abound in thick growths of Elodea. It is claimed in conclusion that there is urgent need of further investigations into the productivity and accuracy of different methods of capture, in different conditions. Only so will it be possible to introduce critically tested standards, and thus, in respect of larval oecology, to raise practical malariology to a higher level.

v. Montschadsky (A.). Über das Wachstum und die Funktion der Analkiemen bei den Larven von *Anopheles maculipennis* Mg. [**The Growth and Function of the Anal Gills in the Larvae of** *Anopheles maculipennis*.]—pp. 65–83. With 6 tables & 5 graphs.

Though concerned with larvae of *Anopheles maculipennis*, Montschadsky's paper is mostly outside the scope of this *Bulletin*. According to its author, the object of this highly technical article is to emphasize the need for experimental reconsideration of the function of the anal gills. There are grounds for thinking that the office of the anal gills is not confined to breathing, but is rather of an excretory nature, or has even to do with the regulation of osmosis.

vi. Burakova (L. W.). Zur Methodik der Untersuchung und des Nachweises der *Phlebotomus*-Arten. [**The Method of investigating and demonstrating the Species of** *Phlebotomus*.]—pp. 93–98.

Beyond suggesting that, in places in which collecting by ordinary methods is difficult, the presence of sand-flies may be demonstrated by the aid of "tanglefoot," this short paper relating to Phlebotomus appears to include little of special interest.

vii. Pavlovsky (E. N.), Stein (A. K.) & Bytschkov (W. A.). Experimentelle Untersuchung der Wirkung des Speichels der Larve von *Calliphora erythrocephala* auf die Hautdecke des Menschen. [**The Effect of the Salivary Secretion of the Larva of** *Calliphora erythrocephala* **upon the Human Skin.**]—pp. 99–110. With 4 figs. & 1 table.

In connexion with the use of maggots in the treatment of osteomyelitis and other maladies, the authors tested the action of the salivary secretion of larvae of *Calliphora erythrocephala* (the common blowfly) and *Musca domestica* on the normal human integument. The salivary glands of the former, after removal from living adult larvae, were emulsified in physiological solution, and the emulsion was injected subcutaneously into man. The injection produced an inflammatory reaction in the form of a vesicle, which subsequently became an urticating papilla; these effects passed off on the second or third day. The salivary secretion of larvae of *Musca domestica* behaved in a similar manner, but its effects were more transient. The active principle of the salivary secretion of the larvae of *C. erythrocephala* is unaffected by heat.

viii. Tinker (J. S.) & Senkewitsch (M. A.). Einige Beobachtungen in Bezug auf die Ökologie der Zieselmausflöhe im Zusammenhang mit ihrer Rolle in der Epidemiologie der Pest. [**The Oecology of Suslik Fleas in Connexion with their Rôle in the Epidemiology of Plague.**]—pp. 203–215. With 3 figs. & 2 tables.

The flea parasites of the suslik (*Citillus citillus*) do not remain permanently on their hosts or in their burrows, but make nocturnal

excursions to the outer world and return to the burrows by day. When pads of loose wadding, two to each hole, were introduced into burrows, a pad inserted in the morning being left for varying periods of time up to twelve hours, the other being allowed to remain throughout the night, fleas were subsequently found on the outside of the morning pad, which was close to the surface of the ground, but on the inner side of the other and lower pad. It thus appears that the fleas congregate above ground at night, which is therefore potentially the more dangerous period, provided that the insects contain the plague bacillus. On the surface of the ground near suslik holes, on six occasions, the authors collected in all 190 free-living fleas belonging to the species *Neopsylla setosa* and *Ceratophyllus tesquorum.*

ix. Zolotarev (N. A.). Zum Artenbestand und zur geographischen Verbreitung der Zecken (*Ixodidae*) in Dagestan. [**The Species of Ticks** (*Ixodidae*) **in Daghestan and their Geographical Distribution.**] —pp. 217–227. With 2 charts.

Although this paper on the ticks of Daghestan (Caucasia) is unfortunately not provided with the usual German summary, the numerous lists of species, being printed in ordinary italics, are readily intelligible. *E. E. Austen.*

Lamborn (W. A.). **Annual Report of the Medical Entomologist for 1934.**—*Nyasaland Ann. Med. & San. Rep. Year ending 31st December, 1934.* Appendix I. pp. 65–69.

Dr. Lamborn's report gives as usual an account of interesting and well devised observations and experiments.

He made tsetse fly surveys in the Dowa and Fort Manning Districts in the Northern Province and expresses the opinion that the position as regards fly in these regions remains satisfactory. He visited also the shore of the Lake in the Dowa district where a township is projected at the head of the railway. Here tsetse swarmed as twenty years ago when the Sleeping Sickness Commission of the Royal Society was there. He learnt that a large acreage for cotton growing had been applied for by Europeans and thinks that this cultivation will go far to reduce the fly menace ; he therefore does not advise any special measures for fly reduction.

He gives an account of the researches made by J. G. Thomson and himself on mechanical transmission of trypanosomiasis, leishmaniasis and yaws by blood-sucking non-biting flies [*ante*, p. 68]. When Thomson left Lamborn endeavoured to ascertain whether *L. donovani* and *L. tropica* can undergo cyclical development within *Musca spectanda*, the fly which was used in the joint experiments. He fed the flies on cultures of leishmania and then allowed them to feed at scratches on the ears of experimental dogs [number not stated]. None of the animals showed signs of infection. Many of the flies were dissected but leishmania were not found. " I had indeed little expectation otherwise since the flagellates do not occur in the cultures in the resting phase in which they must normally be ingested by an insect vector."

Other observations were concerned with leprosy. The author wished to find out to what extent *M. sorbens*, which seems to select the foulest of sores for feeding, ingests and passes the leprosy bacillus. He examined the faecal deposits of bred flies fed on a leprous sore. Up to 2 days all were positive, on subsequent days 32 out of 71, 6 out of 17,

3 out of 36, 20 out of 44 ; on the 10th day 1 out of 24 and on the 13th 1 out of 16. He considers that his evidence tends to show that *M. sorbens* may be the transmitting agent of acid-fast bacilli present in a leprous sore, through its vomit drop or excreta. Passage through one of these flies may be necessary to activate the organism and make it infective, its capsule undergoing partial solution perhaps, for simple implantation of the bacillus does not produce infection. He thinks that the rôle of Muscids in the transmission of leprosy has been little explored. Other observations concerned Tabanidae. *A. G. B.*

Blacklock (D. B.). **Screencloth for Houses in the Tropics.**—*Ann. Trop. Med. & Parasit.* 1935. July 17. Vol. 29. No. 2. pp. 261–263.

This paper makes practical proposals for the reduction of the cost of screencloth as wire gauze is technically called.

The author points out that the chief factor in maintaining the price of screencloth has been the irregular orders for this material specifying many different meshes, and gauges of wire. So long as manufacturers have to set up and adjust machines—a very costly item—to produce a large variety of sizes of mesh, and use wire of different gauges, the cost of the material is bound to remain high. Whereas if requisitions of screencloth were standardized to one or two types, there would be a great fall in the cost of production.

He advises, therefore, the adoption of *MacArthur's recommendations to employ for buildings screencloth of 14 meshes to the linear inch, woven of wire of no. 30 Imperial Standard Wire Gauge ; and for screening water tanks, etc., an 18-mesh screencloth of 30 I.S.W.G. The reason for advocating a finer mesh for the latter purpose is that freshly-emerged mosquitoes might be able to force their way through a coarser mesh before their chitinous exo-skeleton has finally set. Blacklock suggests that for screening water-containers where, unlike houses, the exclusion of light is immaterial, a stouter wire—*i.e.*, 28 I.S.W.G. would provide a more durable material.

One of the newer metal compositions, a British product known as Barronia metal, is strongly recommended by the author. To his knowledge, screencloth made of this material was fixed in the windows of an animal house in the exacting climate of Sierra Leone, where it remained quite unprotected from the weather for well over two years. At the end of this trial period the wire was examined and was found to show no signs of wastage or corrosion. Barronia wire does not require painting as the slight film which forms on the wire from weathering acts as a protective covering and increases the resistance to corrosion. Another strong point in favour of Barronia is that its cost is only some two-thirds that of Monel metal. *W. P. MacArthur.*

McMahon (J. P.). **Preliminary Notes on the Control of Flies.**—*East African Med. Jl.* 1935. Aug. Vol. 12. No. 5. pp. 128–135. [Summary appears also in *Bulletin of Hygiene.*]

The paper discusses flies coming from sanitary traps, pit latrines, etc., in Nairobi : also the possibility of using repellents.

The enquiry arose because of the abundance of *Musca* in parts of Nairobi, and it was easy to show that they came principally from the

*Sanitation Supplement of *Trop. Dis. Bull.*, 1923, p. 12.

area in which night-soil was deposited and buried in rather shallow trenches. The very familiar objections to this system of disposal are set forth. It was found also that a considerable number of flies were coming from pit latrines. Apparently these are deep, but not dark or fly-proof. The author states that naphthalene was occasionally successful as a repellent, but that he got more complete and consistent results with paradichlorbenzene in powder form. He put about 2 lb. of this in a pit latrine when he started operations, and after that reduced his application to 4 oz. once a week.

It is clear that the members of the group of house-flies very closely related to *Musca domestica* differ from one another in points of anatomy and of behaviour. The majority of those bred from Nairobi are apparently a new species, the description of which by PATTON is in the press. It is quite possible that this species cannot be controlled by methods which are so successful in West Africa, but we suggest that the authorities in Nairobi might experiment with the Otway pit. The paper states that considerable numbers of *Lucilia sericata* were bred from some of these deposits of faeces: that may be so, but is the identification correct? Small green *Chrysomyia* commonly breed in such places in tropical countries. *P. A. Buxton.*

SALEM (H. H.). **Myiasis in Egypt.**—*Jl. Egyptian Med. Assoc.* 1935. Apr. Vol. 18. No. 4. pp. 238–254.

Though largely a compilation of published statements on myiasis elsewhere than in Egypt, this paper contains a modicum of original matter. Ocular myiasis, usually due to larvae of *Wohlfahrtia magnifica*, is the commonest condition within the limitations of the title, especially in Cairo and lower Egypt; from Upper Egypt it has so far not been reported. Larvae of *Sarcophaga dux* var. *exuberans* have likewise been met with (in one instance) in the human eye, and also in the ear. A particularly interesting case was that in which larvae of three different species of flies—*Eumerus vestitus* (which normally breeds in decaying onions), *Musca domestica* and *Piophila casei* (the "cheese maggot" fly)—issued from the ear of a child suffering from otorrhoea. Two cases of intestinal myiasis caused by *Sarcophaga hirtipes* and *S. dux* var. *exuberans* have been observed by the author, who, however, has yet to meet with the much rarer condition known as urinary myiasis.

E. E. Austen.

JOBLING (B.). **The Effect of Light and Darkness on Oviposition in Mosquitoes.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. July 31. Vol. 29. No. 2. pp. 157–166. [9 refs.]

The paper describes experiments, the purpose of which is to define the conditions under which female Culex most readily lay eggs: in particular the degree of illumination is selected for study.

In spite of the fact that egg-rafts of Culex are nearly always deposited at night, it is clear from observations in the field that the female prefers a water which is shaded to one freely exposed to what little light there may be. For instance, in cage experiments more egg-rafts were laid in a Petri dish standing on black paper than in one standing on white paper. A very little shading of the water surface caused it to be chosen by female *C. pipiens* of the autogenous race, provided they had had a meal of blood: those which had had no meal showed no discrimination, the whole experiment being performed twice with consistent results.

Having shown that hay infusion was much more attractive than water to his insects, the author experimented with those two liquids, shading the water with a paper collar : the great majority of females still chose the hay infusion.

It would be of interest if the work could be extended, a controlled illumination of very low intensity being used, and measured at the water surface. *P. A. Buxton.*

Buxton (P. A.). **Changes in the Composition of Adult *Culex pipiens* during Hibernation.**—*Parasitology.* 1935. May. Vol. 27. No. 2. pp. 263–265. With 1 fig.

In *Culex pipiens* as in *Anopheles maculipennis*, both of which hibernate as adults, there is a characteristic autumnal accumulation of fat, which gradually disappears as winter progresses. As to the amount of fat stored up, and its rate of disappearance, knowledge is lacking. The author's observations were made on adult female *C. pipiens*, collected in a cellar in Kent " at intervals from September to April in the years 1930–4." After being killed and weighed, the insects were dried to a constant weight at 105°C., and treated with ether, it being assumed for experimental purposes " that what is lost at 105°C. is water, and what dissolves in ether is fat," though " neither assumption is strictly accurate." It appears that " As hibernation proceeds, there is a gradual reduction in the female's total weight from over 3 to under 2 mg. " ; and that " Towards the end of hibernation, particularly in March and April, the figure for fat is very low, falling to about one-seventh of what it was in September and October. . . . The solids other than fat show remarkably little change in weight during the period of hibernation . . .", though a great rise occurs in the proportion that they bear to the whole. With the progress of hibernation " the weight of fat decreases more rapidly than that of water," the proportion of which " rises during hibernation." It may be assumed that " as the fat disappears, the space which it occupied is partly filled by increasing the amount of air in the diverticula, so that the insect's loss of weight is greater than the reduction in its size." *E. E. A.*

Keilin (D.), Tate (P.) & Vincent (M.). **The Perispiracular Glands of Mosquito Larvae.**—*Parasitology.* 1935. May. Vol. 27. No. 2. pp. 257–262. With 2 figs. [13 refs.]

Glands producing an oily secretion, such as have been described by Keilin and others in the larvae of many Diptera, are here described in detail in Culicine and Anopheline mosquitoes. In both groups they lie close to the spiracular opening, and are clearly responsible for the differential wetting of the spiracular region which permits oil but not water to enter the tracheal system. *V. B. Wigglesworth.*

Trager (William). **The Culture of Mosquito Larvae Free from Living Microorganisms.**—*Amer. Jl. Hyg.* 1935. July. Vol. 22. No. 1. pp. 18–25.

——. **On the Nutritional Requirements of Mosquito Larvae** (*Aëdes aegypti*).—*Ibid.* Sept. No. 2. pp. 475–493. [25 refs.]

The larvae of *Aëdes aegypti* require at least two growth-promoting substances.

One of these is present in large amounts in yeast and aqueous yeast extract, in egg white and in wheat. It is heat- and alkali-stable and is not adsorbed by fuller's earth ; it seems to belong to the " B " group of vitamins. The other, present in large amount only in partly purified liver extracts, may perhaps be related to the anti-pernicious anaemia factor. Both factors are provided by living bacteria or yeasts.

V. B. Wigglesworth.

Yang (Foo-Hai). Zur Kenntnis der Phlebotomen-Arten in China und zur Aetiologie des Phlebotomen-fiebers. (Mit einem Anhang ueber die Verbreitung des Insekts in China.) [**Species of Phlebotomus in China ; their Prevalence and Part played in the Aetiology of Sand-fly Fever.**]—*Far Eastern Assoc. Trop. Med. Trans. Ninth Congress, Nanking, China, 1934.* Vol. 1. pp. 495–502. With 6 figs. on 1 plate & 1 map. [20 refs.]

There are three species of phlebotomus which have been associated with sand-fly fever in China. The author discusses the differentiation of these by means of a special study of the male generative organs. He also gives a map showing the distribution of these species. He attempted by means of tissue culture experiments, using some of the newer methods employed in the culture of Rickettsia, to isolate a germ but without any result. *D. Harvey.*

Ohmori (Nanzaburo). **Experimental Studies on the Influence of Low Temperatures upon the Tropical Bed-Bug (*Cimex hemipterus* Fabricius). Second Report. On the Influence of a Temperature of 3°C.**—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. Formosa).* 1935. June. Vol. 34. No. 6 (363). [In Japanese pp. 702–713. With 1 fig. [21 refs.] English summary pp. 714–715.]

The paper is an extension of one previously noticed (*ante*, p. 670). The author has bred tropical bedbugs (*Cimex rotundatus*) at 27°C. and then exposed them to 3°C., bringing them back to 27°C. to observe the effect of low temperature. He finds that at 3°C. the eggs are not affected by an exposure of 3 days, that nearly all are killed after 15 days, and all after 20 days. Moreover, eggs that have been recently laid will survive this temperature for a longer period than eggs which are 2–4 days old at the beginning of the experiment. A range of experiments with nymphs and adults, fed and unfed, is also recorded. At all stages the insect shows considerable powers of resistance to this low temperature, and this is surely remarkable in view of its restriction to warm parts of the globe. *P. A. Buxton.*

Ferris (Gordon Floyd). **Contributions toward a Monograph of the Sucking Lice. Part VIII.**—*Stanford Univ. Publ., Univ. Ser. Biol. Sci.* 1935. Vol. 2. No. 8. pp. 529–620. With 3 plates & 33 text figs.

This work is the final part of an important monograph which began to appear in 1920. The present part is mostly concerned with *Pediculus* and *Phthirus*.

Professor Ferris confines himself rather strictly to matters of anatomy and systematics. Under each genus he gives a full synonymy and definition of the anatomical characters of the genus. In the case of

Pediculus, this is followed by a synonymy of the species which have at some time been referred to it (many of which are not sucking lice at all), and by a selected bibliography. The author has examined a very large amount of material from human beings in all parts of the world, and discusses two vexed questions: the distinctness of head and body lice, and the existence of particular races of lice on certain races of man. After a very detailed examination of the external anatomy, he concludes that no point of difference exists by which head and body lice may be separated with confidence, though he observes that certain strains exist in nature " in which the typical characteristics that are supposed to define these two forms are clearly developed." The two forms are referred to as *capitis* and *corporis*, but the author refuses to give them formal recognition even as subspecies. He points out, quite correctly, that the experimental evidence on hybridization and on adaptation to changed environment, though incomplete, points to the same conclusion.

Turning to the question of lice from different races and to the study of the so-called species which have been described, Professor Ferris finds no points of difference except in *maculatus* Fahrenholz, which occurs on negro races ; even this form, which is typically distinguishable by small size, compact shape and dark colour, shows no sharp anatomical points of distinction and inter-breeds completely with head lice and body lice from other races of man.

The points here discussed have considerable interest outside pure taxonomy. Specimens and literature have been fully considered by a great authority on the anatomy of biting lice, and his conclusions do not differ greatly from those arrived at by Nuttall nearly twenty years ago. Now that the anatomists have failed to find constant reliable differences between head louse and body louse, we may perhaps assume, until the contrary is proved, that they are equally effective as vectors of micro-organisms. [May we also hope that examiners who continue to ask candidates to repeat an out-worn creed about the differences between these insects may be led to knowledge of the truth ?]

P. A. B.

Herms (W. B.), Bailey (S. F.) & McIvor (B.). **The Black Widow Spider.**—*Bull. Calif. Agric. Exp. Sta.* Berkeley, California. 1935. June/ No. 591. 30 pp. With 14 figs. [24 refs.] [Summarized in *Rev. Applied Entom.* Ser. B. 1935. Sept. Vol. 23. Pt. 9. p. 212.]

" The increase in the number of reported cases of bites by the poisonous Theridiid, *Latrodectus mactans*, F., is thought to be due to more accurate diagnosis and to the gradual adaptation of the spider to living in shelters erected by man.

" Notes are given on its distribution, morphology and bionomics, and the nature of its venom, its effect on laboratory animals and man, and the treatment of bites in the latter are discussed. Owing to its wide distribution, solitary habits and varied habitat, it is difficult to control. It almost invariably recovers from the effects of fly sprays but is killed when sprayed directly with creosote, which also acts as a repellent. Only three natural enemies are known, *viz.*, the Scelionid, *Baeus latrodecti*, Dozier, which was taken in Haiti and is a true egg parasite (a single larva killing a single egg), and a Chloropid and a species of *Gelis*, which were observed in California feeding on the eggs in the egg-sac and destroying complete broods."

Frawley (J. M.) & Ginsburg (H. M.). **The Diagnosis and Treatment of Black Spider Bite.**—*Jl. Amer. Med. Assoc.* 1935. May 18. Vol. 104. No. 20. pp. 1790–1792.

In the last 7 years 52 cases of black spider bite (*Latrodectus mactans*) have been treated at Fresno, California. The chief symptom is severe pain over the abdomen and rigidity of the abdominal muscles. No deaths have resulted. The patients are treated thus :—

" 1. The patient is immediately put to bed and iodine is applied to the site of the bite.

" 2. A soapsuds enema is administered, and fluids are given freely by mouth.

" 3. Morphine sulphate is given hypodermically to control the pain and sodium amytal to insure rest.

" 4. Magnesium sulphate, a 20 cc. ampule of 10 per cent. solution, is given intravenously, to be repeated as required to overcome the hypertension and the spasticity of the muscles.

" Results with this form of treatment have been very satisfactory. Last summer we used it in eleven cases. It was never necessary to give more than one dose of magnesium sulphate. The patients were usually free from symptoms within twenty-four hours." *A. G. B.*

Brunon (Roger). Notes sur l'hygiène publique en Afrique noire. Soleil et nudisme. Régimes alimentaires. Logement. Sport et culture. Hygiène morale.—*Ann. d'Hyg. Pub., Indust. et Sociale.* 1935. July. Vol. 13. No. 7. pp. 386–395.

Castronuovo (Giovanni). Malattie dominanti in Abissinia e loro prevenzione. —*Giorn. Ital. di Malat. Esot. e Trop.* 1935. June 30. Vol. 8. No. 6. pp. 139–142, 145–148, 151–154.

Craig (Charles F.). Theobald Smith and the Insect Transmission of Disease.— *Amer. Jl. Trop. Med.* 1935. July. Vol. 15. No. 4. pp. 407–414.

Dreyfus (M.). Observation de myiase des voies lacrymales à sarcophaga.— *Rev. Méd. et Hyg. Trop.* 1935. May–June. Vol. 27. No. 3. pp. 114–115.

Guzewitsch (A. W.) & Podoljan (W. J.). Die Pyrethrum-Rauchlichter als Bekämpfungsmittel der Stechmücken und der Phlebotomen.—*Rev. Microbiol., Epidémiol. et Parasit.* 1935. Vol. 14. No. 1. [In Russian pp. 87–98. With 1 fig. German summary p. 98.]

Lindsay (John W.). Medical Services in the Chaco War.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. Apr. Vol. 28. No. 6. pp. 539–558. With 2 maps.
A very interesting address, not suitable for summary.

Manson-Bahr (Philip). A Commentary on the Diary kept by Patrick Manson in China and now conserved at Manson House.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1935. June 29. Vol. 29. No. 1. pp. 79–90. With 1 plate.

Massias (Charles). Myosites suppurées observées en Cochinchine.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1935. Feb.–Mar. Vol. 13. No. 2. pp. 83–86. [11 refs.]

Mazzolani (D. A.). Pseudo-emottisi irudinea in Tripolitania.—*Policlinico.* Sez. Prat. 1935. Aug. 19. Vol. 42. No. 33. pp. 1634–1641. [32 refs.]

Palit (A. N.). Splenectomy for Tropical Splenomegaly.—*Indian Med. Gaz.* 1935. May. Vol. 70. No. 5. pp. 243–247. With 1 fig.

Pervès. Observations de météorologie médicale recueillies pendant les années 1933 et 1934 à Tamanrasset (Hoggar).—*Bull. Acad. Méd.* 1935. June 4. 99th Year. 3rd Ser. Vol. 113. No. 21. pp. 809–813.

Royal College of Physicians of Edinburgh. Annual Report by the Curator of the Laboratory for the Year 1934 [Philip (Robert)].—25 pp.

von Schuckmann (W.). Ueber das Vorkommen tierischer Entoparasiten beim Menschen in Deutschland.—*Reichs-Gesundheitsblatt.* 1935. June 26. Vol. 10. No. 26. pp. 571–574. [17 refs.]

Stannus (Hugh S.). The Care of European Children in the Tropics.—Reprinted from *Practitioner.* 1935. Aug. Vol. 135. pp. 138–145.

REVIEWS AND NOTICES.

WHITFIELD (F. G. Sarel) [F.R.E.S., F.R.M.S., Entomologist to the Sudan Government, Wellcome Tropical Research Laboratories, Khartoum, etc.] & WOOD (A. H.) [M.A. (Cantab.), Entomologist to the Gezira Agricultural Research Service, Sudan Government]. **An Introduction to Comparative Zoology. A Text-book for Medical and Science Students.** With a Foreword by Maj. Sir Robert ARCHIBALD, C.M.G., D.S.O., M.D., Late Director, Wellcome Tropical Research Laboratories, Sudan Government, Khartoum.—pp. x+354. With 141 illustrations. 1935. London: J. & A. Churchill Ltd., 40, Gloucester Place, Portman Square. [15*s.*]

The vigorous style of this volume, with its many similes calculated to appeal to the young student, would by itself suggest the work of a teacher—even without the summaries scattered through the book, the elaborate comparisons, and the warnings against pitfalls such as the two uses of the word plasmodium. (It might have been pointed out that in one case it is written with a capital and in the other with a small letter.) Teachers may, however, not be good writers of textbooks, and whether this is a good one or not is a matter of opinion.

Its avowed and excellent object is to provide a wide zoological basis on which might be built any superstructure of specialized Biology, academic or applied. (There is, however, a distinct bias towards the latter.) Hence the extensive classifications, and the chapters on Metabolism, Heredity, Evolution and Ecology. It is good to find allusion to certain matters of very general interest which are often omitted, such as the tadpole of the Frog, and, under Dogfish, to cod liver oil and mermaids' purses. The special reference to the choice of examples " occurring more or less universally " seems to have resulted merely in omission of details concerning the Crayfish (for which there is something to be said on other grounds) and in putting in the Locust as a second insect, although there are surely Cockroaches wherever there are likely to be classes in Zoology. Otherwise there are the usual " types " of the elementary course. Beside these are given more or less detailed accounts of selected organisms of medical or veterinary importance. In such a company it is rather surprising that Hookworms and Leeches, for example, should not be recognizably mentioned. Would it not have been advisable to use otherwise the space devoted to Sponges (with no labelled figures), to the Locust (with no account of its migrations), to the Adelochorda and Urochorda, to the disagreements of various workers about the minute anatomy of the schistosome cercariae, and to tables of classical names with no clue as to the nature or importance of the animals designated ?

It is not an easy book for an elementary student to use, wherein might possibly lie much virtue. Much diligence, for example, would be necessary for him to discover exactly what *is* meant by the " double line " in Table 1; perseverance and some daring to trace out the meaning of " metamorphosis " when he meets this term on pp. 57 and 104; ingenuity might connect *Schistosoma* of the figures and tables with the " human blood flukes " of the text, and so on. Those who worked out some of the elaborate and obscure figures (such as nos. 26c, 78, 93, 100, 104, 108) should know something of their subject. (Suggestive letters are more helpful on a diagram than numbers, and too often

there is no reference to the figures in the text.) But how many students would rise to the occasion ? And the reviewer for one would be completely baffled in an attempt to find out the approximate dimensions of many of the Protozoa, of most of the Worms, eggs, etc. (which to one in the elementary stage might be almost any size) ; or to obtain any idea of a " Trochophore " (p. 21), of the " Hirudinea " (p. 23), of the Pseudophyllidea (p. 74), or of " *Cyclops* " (p. 75) for example.

It is perhaps a pity that two specialists in the same branch of Zoology should have collaborated in this general work. As they would probably say, it must have been " extremely " difficult to avoid making unusual statements in other branches, such as should have no place in an elementary textbook unless attention is especially drawn to them : statements such as that red blood corpuscles are the " chief source of food " of *Entamoeba histolytica* ; that *Euglena* can " perform slow slug-like movements, similar to the less active movements of the Amoebae " and feeds holozoically ; or that *Amoeba proteus* " sometimes undergoes a process known as plasmogamy . . . into a single mass containing several nuclei . . . known as a plasmodium." These are a few examples taken from the Protozoa.

The reviewer submitted the large entomological section to a teaching colleague who is a specialist in this subject ; and it is disappointing to find even here inaccuracies and inadequacies both in text and figures, some of which might be very misleading.

The book is well produced, and very moderate in price, and many of its weaknesses could be remedied in another edition. In view of this possibility it is pointed out that there are a good few misprints in addition to those noted at the beginning of the introduction.

Margaret W. Jepps.

Soegiri. **Bijdrage tot de kennis van de primaire longinfecties en van de frequentie der tuberculose in Indië.** [Primary Tuberculous Infections of the Lungs and the Frequency of Tuberculosis in the Netherlands Indies.] [Thesis for Doctorate of Medicine, School of Medicine, Batavia.]—174 pp. With 155 figs. (6 on 4 plates). [62 refs.] 1935. Batavia-C. Drukkerij Centrum. [Review appears also in *Bulletin of Hygiene*.]

This thesis for the M.D. degree, School of Medicine, Batavia, deals with the question of pulmonary tuberculosis purely from the aspect of morbid anatomy as revealed by post-mortem examination of 256 bodies, 159 adult and 13 young Malays, 51 adult Chinese and 27 Chinese children, 5 Europeans, and 1 negro. The findings need not be detailed here ; they were similar to what has been found elsewhere, notably by Blacklock in Great Britain (see *Bull. of Hyg.*, 1933, Vol. 8, p. 44) and Scott in Hongkong (*Ibid.*, 1931, Vol. 6, p. 341 and this *Bulletin*, Vol. 19, p. 405) whose results have been issued as Medical Research Council Special Reports.

The author concludes that primary tuberculous lung infections in adults in Batavia are recently acquired. He notes the finding of well-defined fibrous lesions in the lymphatic glands sometimes with calcified, fibroid or active changes in the lung. " In some cases," he states " there is no sign of any lung lesion " ; seeing that his thesis deals with primary tuberculous infection of the lungs, the meaning of this absence

of lesion is dubious. He considers these fibrous gland lesions "as specific regressive lesions, some of them may almost attain complete restitutio ad integrum." Either the lung has achieved this complete restitutio or the gland is not infected secondarily to the lung, but this does not appear to be discussed. Perhaps the author is not at home with English literature on the subject, for though 62 references are appended no mention is made of any British workers who have probably done as much as any on this interesting aspect of the disease.

H. H. S.

GHOSH (Birendra Nath). **A Treatise on Hygiene and Public Health with Special Reference to the Tropics. Eighth Edition.**

This book was reviewed in the *Bulletin of Hygiene*, 1935, Vol. 10, p. 684.

Printed under the authority of HIS MAJESTY'S STATIONERY OFFICE
by the South Essex Recorders, Ltd., High Road, Ilford.

(1682) Wt. P1/144 1875 12/35 S.E.R. Ltd. Gp. 353.

INDEX OF AUTHORS OR SOURCES.

The bracketed abbreviations after the page numbers indicate the subjects.
Page numbers within brackets indicate papers not summarized.

Am. signifies Amoebiasis and Amoebic Dysentery.
Bb. ,, Beriberi and Epidemic Dropsy.
Bl. ,, Blackwater.
B.R. ,, Book Review.
Chl. ,, Cholera.
C.Bu. ,, Climatic Bubo and Lymphogranuloma Inguinale,
Der. ,, Tropical Dermatology.
Dys. ,, Dysentery (Bacillary and Unclassed).
Fev. ,, Fevers.
Hel. ,, Helminthiasis.
Hist. ,, Historical.
H.S. ,, Heat Stroke.
K.A. ,, Kala Azar.
Lep. ,, Leprosy.
Lept. signifies Leptospirosis.
Mal. ,, Malaria.
Misc. ,, Miscellaneous.
Oph. ,, Tropical Ophthalmology.
Pel. ,, Pellagra.
Pl. ,, Plague.
Rab. ,, Rabies.
R.B.F. ,, Rat-Bite Fever.
R.F. ,, Relapsing Fever and other Spirochaetoses.
Sn. ,, Venomous Snakes and Snake Venoms.
Sp. ,, Sprue.
S.S. ,, Sleeping Sickness.
Y.F. ,, Yellow Fever.
Y. & S. ,, Yaws and Syphilis.

A.

Aalsmeer, W. C., 1 (Bb.)
Abdel Sayed, I., (781) (Am.)
Abdulkadir-Lufti, 233 (Hel.)
Acton, H. W. & Ghosh, L. M., 184 (Der.)
Adams, A. R. D., 636 (Hel.)
Adams, C., with Faust, Wells & Beach, 267 (Hel.)
Adhikari, A. K., with White, 141 (Mal.)
Adler, S., 87 (K.A.)
—— & Theodor, O., 487 (K.A.)
Advier, 592 (Y.F.)
Advier, M., with Blanchard & Blondin, 851 (Pl.)
——, with Mathis & Durieux, 288 (Y.F.)
Afanador, A., 346, 554 (Lep.)
Africa, C. M., 671 (Misc.)
—— & Garcia, E. Y., 776 (Am.)
Agrikolanski, N. & Tiburskaya, N., 776 (Am.)
Aguayo, M., with Varela & Gay, 564 (Fev.)
Ahuja, M. L., with Taylor, 767 (Chl.)
Air Ministry, (227) (Misc.)
Akashi, K., 775 *bis* (Am.)
Alain, M., 210 (Bl.)
Albert, J. & Paulino, P., 636 (Hel.)
Alberto Videla, C., 406 (Mal.)
Albornoz, F., 455 (Pl.)
de Alda Calleja, M., (92) (K.A.)
Aldao, A., with Dios, de Sommerville, Bonacci & Barba, 511 (Misc.)
Aldick, W., 184 (Der.)
Alessandrini, G., (752) (Mal.)
Alexa, E., with Ciuca & Franke & Agapi Pupu & Manoliu, 745 (Mal.)
——, with Slatineanu, Ciuca, Balteanu, Alexa, I., Francke & Rugina, 411 (Mal.)
Alexa, I., with ——, ——, ——, Alexa, E., Francke & Rugina, 411 (Mal.)
Alexander, E. R., with Irgang, 520 (Misc.)
Alicata, J. E., with Schwartz, 265 (Hel.)
Allen, F. R. W. K., 526 (Misc.)
Allen, L. H., with Boyd, 119 (Mal.)
Almaraz, P., with Mazza, 37 (S.S.)
Alonso, J. M., with Lagrosa, Tiong & Paras, 547 (Lep.)
Altenkamp, T., 634 (Hel.)
Althausen, D. S., with Sinelnikow, Moldawskaja-Kritschewskaja, Gorchowa & Gritzay, 792 (Mal.)
Altman, R., with Bovet & Benoit, 117 (Mal.)
Alvarado, C. A., with Sussini & Vaccarezza, 587 (Y.F.)
Alvaro, M. E., 473 (Oph.)
Ambialet, R., 99, 134, 805 (Mal.)
Amy, A. C., 202, 823 (Bl.)
Ancelot, A., with Launoy, 354 (S.S.)
Anchezar, B., with Uriarte, Calcagno & Riesel, 447, (456) (Pl.)
Anderson, C., 480, 484 (K.A.)
—— & Gobert, E., 243 (Hel.)
Anderson, H. H., with Emerson, 347, 548 (Lep.)
——, with —— & Leake, 549 (Lep.)
—— & Reed, A. C., (197) *bis* (Am.)
Anderson, M. X., with Reid, Stubblefield & Ivy, 194 (Dys.)
Anderson, N. P. & Ayres, S., Jr., 531 (Misc.)
Ando, K., 606 (Rab.)
Andreoli, with Gimbert, Houssiaux & Fourest, 168 (Fev.)
Andrews, J., 188, 189 (Am.), 220 (Misc.)
Andrews, M. N., 627 (Hel.)
Annales de Médecine et de Pharmacie Coloniales, 877, 878 (Y.F.)
Annamalai, D. R., with Menon, 273 (Hel.)
——, with —— & Krishnaswamy, 789 (Mal.)
Annecke, S., 394 (Mal.)

Anning, C. C. P., 395 (Mal.)
Apantes, J. B., with Do Amaral & da Fonseca, 217 (Misc.)
Appelbaum, E. & Gelfand, B. B., 108 (Mal.)
Appelmans, M., with van den Branden, 695 (S.S.)
Aragão, H. de B., 860 (Lep.)
Arantes, J. B., with Do Amaral & da Fonseca, 383 (Sn.)
Arantes, L., (873) (Lep.)
Archibald, R., 916 (B.R.)
Arenas, R., with Kouri & Basnuevo, 628 *bis* (Hel.)
Argyropulo, A., with Ioff, (674) (Misc.)
Ariès, C., with Decourt, 492 (K.A.)
Arima, I., (752) (Mal.)
Arjona, B. L., with Barbosa, 820 (Mal.), 837 (B.R.)
Arjona, E., with Zimmermann, 601 (Lept.)
Armstrong, 449 (Pl.)
Arnaud, with Martin, 631 (Hel.)
Arnell, O. R., 139 (Mal.)
Arnett, J. H. & Stabler, R. M., 188 (Am.)
Arnold, K., with Bier, 867 (Lep.)
Artemenko, V., with Korovitski, 232 (Hel.)
Arzeno, M., with De la Barrera, 447 (Pl.)
Aschner, M., with Kliger, 163, 571 (Fev.)
Ascione, G. & Mariotti, E., 794 (Mal.)
Ashford, B. K., 149 (B.R.)
Ashkar, M. F. & Issa, I. I., (655) (Hel.)
v. Assendelft, F., 427 (Mal.)
de Assis, A., 165 *bis*, 166 *bis* (Fev.)
Atchley, F. O. & Swezey, W. W., 225 (Misc.)
Atkey, O. F. H., (348), 538 (Lep.)
Atmann, R., with Novet & Benoit, (820) (Mal.)
Attwood, A. M. P., with Paget & Trevan, 343 (Lep.)
Aubertin, D. & Buxton, P. A., 665 (Misc.)
Augier, P. & Cossa, 576 (Fev.)
—— & Faure-Brac, 490 (K.A.)
Aujaleu, E., with Jame, 557 (Fev.)
Auricchio, L. & Chieffi, A., 86 (K.A.)
Avizonis, P., 896 (Oph.)
Ayres, S., Jr., with Anderson, 531 (Misc.)
Azim, M. A., 622 (Hel.)
Azmy, S., Gaafar, M. & Noshokati, H., 527 *bis* (Misc.)
—— & Taha, S., (198) (Am.)

B

Bablet, J., with Bertrand & Sicé, 349 (S.S.)
Bachman, G. W., Molina, R. R. & Gonzalez, J. O., 268 (Hel.)
—— & Oliver, J., 268 (Hel.)
Bader, H., with Morin, Monnier & Moreau, 727 (Mal.)
Badger, L. F. & Sebrell, W. H., 863 (Lep.)
Baez, P. R., with Hoffmann, 551 (Lep.)
Baeza, M., 183 (Der.)
Bailey, S. F. with Herms & McIvor, 914 (Misc.)
Bailly, J., with Remlinger, 174, 175, 177, 605, 606, 607, 618 (Rab.)
Baily, J. D., with Covell, 93, 399 (Mal.)
Bais, W. J., 56 (Y. & S.)
Baisas, F. E., with Russell, 803, (753) (Mal.)
Baker, C. E., with Stiles, 759 (B.R.)
Baker, J. N., (146) (Mal.)
——, McAlpine, J. G. & Gill, D. G., 564 *bis* (Fev.)
Baki, S., 610 (Rab.)
Baldi, A., (752) (Mal.)
Balena, A., 657 (Misc.)
Balfour, M. C., 736 (Mal.)
Balmus, G., with Slatineanu & Nicolau, 741 (Mal.)
Baltazard, M., with Blanc, Noury, Bruneau & Barneoud, 163 (Fev.)
Balteanu, I., with Slatineanu, Ciuca, Alexa, E., Alexa, I., Francke & Rugina, 411 (Mal.)
Balteanu, J., with Ciuca & Constantinescu, 559, 565 (Fev.)
——, with ——, Sibi, Nitzulescu, Franche, Cantacuzino, Paraschivescu, Veit & Lupu, 469 (Pel.)
Bamford, C. B., 825 (Bl.)
Bamundaga, D., 279 (Hel.)
Banerjee, D. N. & Datta, S. K., 764, (772) (Chl.)
Banos, M., with Guillerm & Nguyen-Van-Lien, 342 (Lep.)
Baonville, H., Ley, J. & Titeca, J., 693 (S.S.)
Barba, R., with Dios, de Sommerville, Bonacci, & Aldao, 511 (Misc.)
Barber, M. A., 806 (Mal.)
——, with Rice, 807 (Mal.)
Barbosa, A., 744 (Mal.)
—— & Arjona, B. L., 820 (Mal.), 837 (B.R.)
Barcroft, J., 821 (Bl.)
Bargehr, P., 543 (Lep.)
Bariéty, M., with Troisier & Brouet, 602 (Lept.)
Barneoud, J., 249 (Hel.)
Barnes, M. F., Metcalfe, A. N., Martindale, W. E. & Lentz, W. J., 179 (Rab.)
Barnett, B. & Macfarlane, R. G., 381 (Sn.)
——, with ——, 380 (Sn.)
Barnett, L., 254, 631 (Hel.)
Barneoud, J., with Blanc, Noury, Baltazard & Bruneau, 163 (Fev.)
Barraud, P. J., 303 (B.R.)
Barros, E., (602) (Lept.)
Barsoum, H., 244 (Hel.)
Basaca, M., with Tubangui & Pasco, 234, 635 (Hel.)
Baserga, A., 534 (B.R.)
Basnuevo, J. G., with Kourí & Arenas, 628 *bis* (Hel.)
——, with —— & Fermoselle Bacardí, 628 (Hel.)
Basso, G., with Basso, R., Mazza & Miyara, 717 (S.S.)
Basu, B. C., 398 (Mal.)
——, with Knowles, 398, 794 (Mal.), 515 (Misc.) 598 (R. F.)
Basu, N. K., 335 (Lep.)
Baudet, E. A. R. F., 646 (Hel.)
Bauer, J. H. & Hughes, T. P., 593 (Y.F.)
Baumann, H., with Schwetz, 115 (Mal.)
Beach, T. D., with Faust, Wells & Adams, 267 (Hel.)
Beck, M. D., with Wynns (599) (R.F.)
Beer, W. A., with McCarrison & Sankaran, 174 (Rab.)
——, with Sankaran, 607 (Rab.)
——, with —— & Iyengar, 174 (Rab.)

Beeuwkes, H., Mahaffy, A. F., Burke, A. W. & Paul, J. H., 282 (Y.F.)
Beklemischev, W., 443 (Mal.)
——, W., with Schipizina, N., Polowodowa, W. & Nabokich, P., 907 (Misc.)
Benard, R., Poumailloux, M. & Brincourt, J., 492 (K.A.)
Benarroch, E. J., (146) *bis*, (752) (Mal.)
Benavides, J., 904 (Misc.)
de Benedetti, A., 431, 817 (Mal.)
Benhamou, E. & Gille, R., 791, 793 (Mal.)
Benignetti, D., with Peli, 92 (K.A.)
Benoit, G., with Bovet & Altman, 117 (Mal.)
——, with Novet & Atmann, (820) (Mal.)
Bequaert, J., 246 (Hel.)
Bequaert, J. C., with Strong, Sandground & Muñoz Ochoa, 300 (B.R.)
Bercovitz, Z. & Rogers, J. M., 253 (Hel.)
Beretervide, J. J. & Grau, C. A., 776 (Am.)
van den Berghe, L., with Kotter, 880 (Y.F.)
Bergerot, J., 623 (Hel.)
Bernardbeig & Caujolle, F., 444 (Mal.)
Bernkopf, H., 381 (Sn.)
Berny, P., 348, 553 *ter* (Lep.)
Bertini, G., 638 (Hel.)
Bertrand, 476 (Oph.)
Bertrand, I., Bablet, J. & Sicé, A., 349 (S.S.)
Bertrand, Y., 15 (S.S.)
Betashe, M., with Hassan, 250 (Hel.)
Bevan, L. E. W., 685 (S.S.)
de Bève, F., 626 (Hel.)
Bhattacharyya, R., with Williams, 417 (Mal.)
Bibliography of Helminthology Year 1933, 759 (B.R.)
Bier, O., with de Oliveira Castro, (583) (Fev.)
Bier, O. G. & Arnold, K., 867 (Lep.)
Biggam, A. G., 745 (Mal.)
Bigot, A. & Le-Van-Trien, 345 (Lep.)
Bilfinger, F., with Lépine, 161 (Fev.)
Bishop, A., 225 (Misc.)
Bishop, E. L., (146) (Mal.)
Bissery, with Gautier, 600 (R.B.F.)
Black, S. H. & Ross, H., 552 (Lep.)
Blackie, W. K., 749 (Mal.), 832 (Bl.)
Blacklock, D. B., 514, 910 (Misc.)
Blanc, F. & Bordes, L. A., 47 (Sp.), (781) (Am.)
Blanc, G. & Gaud, M., 570 (Fev.)
—— & Martin, L. A., 566 (Fev.)
——, Noury, M., Baltazard, M., Bruneau, J. & Barneoud, J., 163 (Fev.)
Blanchard, M., Blondin, P. & Advier, M., 851 (Pl.)
Blanckenburg, K., 795 (Mal.)
Blank-Weissberg, S., (146) (Mal.)
Blaze, J. R. & Simeons, A. T. W., 746 (Mal.)
Blewitt, B., 572 (Fev.)
Blondin, P., with Blanchard & Advier, 851 (Pl.)
—— & Riou, M., 210 (Bl.)
Boase, A. J., 475 (Oph.), 652 (Hel.)
Bobes, S., with Proca & Jonnesco, 180, 618 (Rab.)
Boenjamin, R., (59) (Y. & S.)
Boeriu, V., with Pârvulescu & Constantinesco, 750 (Mal.)
van Bogaert, L., with Borremans, 693 (S.S.)
Boggian, B., 70 (Misc.)
Bogliolo, I., 84, 90, 479, 493 (K.A.)
Bogojawlenski, N. A., Melikowa, T. A. & Demidowa, A. J., 482 (K.A.)
Bolgert, M., with Sézary & Levy, 342 (Lep.)
Bolotina, A., with Tareev, Gontaeva, Raskin & Epstein, 111 (Mal.)
de Bona, G., (92) (K.A.)
Bonacci, H., 721 (S.S.)
——, with Dios, de Sommerville, Aldao & Barba, 511 (Misc.)
Bonestell, A., with Kofoid & McNeil, 222 (Misc.)
Bonne, C., 773 (Am.), 852 (Pl.)
Bonne, W. M., 196 (Dys.), (198) (Am.)
Bonnet, G., with d'Oelsnitz & Raybaut, 493 (K.A.)
Bonnet, M., 17 (S.S.)
Bordes, L. A., with Blanc, 47 (Sp.), (781) (Am.)
Borremans, P. & van Bogaert, L., 693 (S.S.)
Bose, K., 435 (Mal.)
Boumeester, J. E., (146) (Mal.)
Bourgain, M., with Le Chuiton, 568 (Fev.)
Bourgin, P., (752) (Mal.)
——, with Massias & Nguyen-van-Tan, 420 (Mal.)
Bourguignon, G. C., 246 (Hel.), (554) (Lep.)
Bouvier, G., 617 (Rab.)
—— & van Slype, W., 668 (Misc.)
Bovet, D., Benoit, G. & Altman, R., 117 (Mal.)
Boxhall, G. N., Happold, F. C. & Lloyd, L., 222 (Misc.)
Boyd, A. N., with Stewart, 665 (Misc.)
Boyd, G. H. & Allen, L. H., 119 (Mal.)
Boyd, J. E. M., 573 (Fev.)
Boyd, M. F., Cain, T. L., Jr. & Mulrennan, J. A., 806 (Mal.)
——, with Hanson & Griffitts, 735 (Mal.)
—— & Mulrennan, J. A., 135 (Mal.)
—— & Stratman-Thomas, W. K., 404, 405 (Mal.)
——, —— & Kitchen, S. F., 738 (Mal.)
——, —— & Muench, H., 404 (Mal.)
Boyé, 280 *bis*, 874 *bis* (Y.F.)
Bradley, J. A., 109 *bis* (Mal.)
Braga, A. & Faria, A., 608 (Rab.)
Brahmachari, P. N., 84 (K.A.)
Brandt, W., 237 (Hel.)
Brennan, C. H., 520 (Misc.), (834) (Bl.)
Brester, A. & Hulst, L. A., (470) (Pel.)
Brincourt, J., with Benard & Poumailloux, 492 (K.A.)
British East African Territories, Conference of Governors of : 12 (S.S.)
British Empire Leprosy Relief Association, 603 (B.R.)
British Medical Journal, 732, 820 (Mal.)
Bromfield, R. J., with Fairfield, 210, 828 (Bl.)
Brooks, A. G., with Shortt, 607 (Rab.)
——, with ——, McGuire & Stephens, 610 (Rab.)
Broquet, C., 91 (K.A.)
Brouet, G., with Troisier & Bariéty, 602 (Lept.)
Broughton-Alcock, W., 903 (Misc.)
Brown, A., with Silverthorne, 665 (Misc.)
Brown, E. G., 495 (H.S.)
Brown, H. C., with Findlay, 120 (Mal.)

Brown, H. W., 229 (Hel.)
——, with Lamson & Harwood, 237 (Hel.)
——, with —— & Molloy, 635 (Hel.)
Brown, J. Y., 146 (Mal.)
Browning, C. H., Cappell D. F. & Gulbransen, R., 30 (S.S.)
—— & Gulbransen, R., 28, 705, 706, (S.S.)
Brumpt, E., 531, 659 (Misc.), 599 (R.F.), 796 *bis* (Mal.)
——, Duvoir, M. E. & Sainton, J., (279) (Hel.)
—— & Galliard, H., 486 (K.A.)
—— & Langeron, M., 183 (Der.)
Brun, C., with Vaudremer, 865 (Lep.)
Bruneau, J., with Blanc, Noury, Baltazard & Barneoud, 163 (Fev.)
Brunon, R., (915) (Misc.)
Brutsaert, P., with Rodhain, 716 (S.S.)
Bruynoghe, G., with Ronse, 568 (Fev.)
Bryant, J., 475 (Oph.), 650 (Hel.)
Buchanan, J. C. R. & Sanderson, I., 519 (Misc.)
de Buck, A., Schoute, E. & Swellengrebel, N. H., 137 (Mal.)
—— & Swellengrebel, N. H., 137, (444) (Mal.)
Buckner, J. F., 664 (Misc.)
de Buen, E., (444) (Mal.)
Buitelaar, L., 857 (Lep.)
Buky, F., with Spector, 189 (Am.)
Bulkin, A., 552 (Lep.)
Bulletin de l'Office International d'Hygiène Publique, 81 (K.A.), 280, 874 (Y.F.), 783 (Mal.), 844 (Pl.)
Bulletin of the Ophthalmological Society of Egypt, 477 (Oph.)
Burakova, L. W., 908 (Misc.)
Burke, A. W., with Beeuwkes, Mahaffy & Paul, 282 (Y.F.)
Burke, H. L., 52 (Y. & S.)
Burkitt, R. W., (554) (Lep.)
Burova, L., with Moshkovsky, 409 (Mal.)
Busacca, A., 472 *bis*, 895 (Oph.)
Butler, C. S., 889 *bis* (Y. & S.)
Buto, T. & Yamamoto, Y., (92) (K.A.)
Buxton, P. A., 439 (Mal.), 912 (Misc.)
——, with Aubertin, 665 (Misc.)
—— & Lewis, D. J., 369 (S.S.)
Bychowsky, A., 197 (Dys.)
Bytschkov, W. A., with Pavlovsky & Stein, 908 (Misc.)

C

Cadwallader, C., with Vogel, 847 (Pl.)
Cain, T. L., Jr., with Boyd & Mulrennan, 806 (Mal.)
Cairo, 477 (Oph.)
Calcagno, B., with Uriarte, Riesel & Anchezar, 447, (456) (Pl.)
Calcutta, 755, 756 (B.R.)
Callender, G. R., (198) (Am.)
Cameron, J. A. P., 527 (Misc.)
Caminopetros, J., 82 *bis* (K.A.), (674) (Misc.)
——, Contos, B., Pheloukis, T. & Pagonis, A., 575 (Fev.)
Campbell, F. L., Sullivan, W. N., Smith, L. E. & Haller, H. L., 663 (Misc.)
van Campenhout, E., 783 (Mal.)
Campos, N. de S., 335 (Lep.)
Canavan, W. P. N., (752) (Mal.)
Cannavo, L., 575 (Fev.)
Cantacuzino, L., with Slatineanu, Balteanu, Sibi, Nitzulescu, Franche, Paraschivescu, Veit & Lupu, 469 (Pel.)
Cappell, D. F., with Browning & Gulbransen, 30 (S.S.)
Carman, J. A., 520 (Misc.), 890 (Y. & S.)
Cartaña Castella, P. & Gil Collado, J., 307 (B.R.)
Carton, P., with Morin, (753), (820) (Mal.)
Castellani, A., 73 (Misc.), (279) (Hel.)
—— & Jacono, I., 181 (Der.)
Castillon, L., 824 (Bl.)
Castex, M. R. & Greenway, D., (198) *bis* (Am.)
Castle, W. B., with Rhoads, 46 (Sp.)
——, with ——, Payne & Lawson, 263 *bis* (Hel.)
Castronuovo, G., (915) (Misc.)
—— & Geracitano, A., 422 (Mal.)
Catanei, A., 182 (Der.), 529 (Misc.)
—— & Goinard, P., 182 (Der.)
——, with Montpellier, 182 (Der.)
——, with Parrot, 739 (Mal.)
——, with Sergent, Edm. & Sergent, Et., 120 (Mal.)
Caujolle, F., with Bernardbeig, 444 (Mal.)
Cavalade, 901 (Misc.)
Cavalcanti, L. R., (470) (Pel.)
Cawston, F. G., 249, (279) *bis*, 623, 627, (655) (Hel.)
Cazanove, 69 (Misc.)
Chabrillat, 905 (Misc.)
Chagas, E., 37, 364 *bis*, 721 (S.S.)
Chaĭkin, V. I. & Enikolopov, S. K., 734 (Mal.)
Chalam, B. S., with Newman, 417 (Mal.)
Chand, D., with Hicks, 749 (Mal.)
Chand, K. & Harbhagwan, 800 (Mal.)
Chang, C. & Robertson, D. S., (198) (Am.)
Chang, H. & Chou, S., (781) (Am.)
Charters, A. D., 823 (Bl.)
Chatterjee, K., with De, 490 (K.A.)
Chatterjee, K. D., with De, 272 (Hel.)
Chatterjee, T., 523 (Misc.)
Chatterji, K. R., with Muir, 539, 543 (Lep.)
Chatterji, S. N., (554) (Lep.)
Chaudhri, J. R., with Yacob, 638 (Hel.)
Chaudhuri, R. N., with Chopra, 419 (Mal.)
Chaussinand, R., with Dorolle & Tran-van-Tam, 608 (Rab.)
Chavarot, M., with Hamel, (445) (Mal.)
Chavarria, A. P., with Rotter, 181 (Der.)
Chavarria, P., with Rotter, 489 (K.A.)
Chen, H. T., (279), 620 *bis*, 629 (655) *bis* (Hel.)
—— & Wang, S., (655) (Hel.)
Chen, W. L. & Rose, G., (655) (Hel.)
Cheng, C. L., with Feng, (554) (Lep.)
Chesley, A. J., with McCoy, (198) (Am.)
Chesney, A. M., with Turner, 57 (Y. & S.)
Chesterman, C. C., 498 (C.Bu.)
Chi, C. K., with Wu, 775 (Am.)
Chianese, R., (170) (Fev.)
Chieffi, A., with Auricchio, 86 (K.A.)
Ch'in, T. L., 183 (Der.)
Chini, V., (752) (Mal.)
Chinn, A. B., with Spies & Payne, 468 (Pel.)

Chiyuto, S., 543 (Lep.)
Chopra, R. N., (198) (Am.), 756 (B.R.)
—— & Chaudhuri, R. N., 419 (Mal.)
—— & Chowhan, J. S., 379 (Sn.)
—— & Ganguli, S. K., 788 (Mal.)
——, —— & Roy, A. C., 787 (Mal.)
—— & Ghosh, S., 528 (Misc.)
——, —— & Dutt, A., (532) (Misc.)
——, Mukherjee, S. N. & Sen, B., 789 (Mal.)
——, Roy, A. C. & Gupta, B. M. D., 412 (Mal.)
—— & Sen, B., 111 (Mal.), (198) (Am.)
——, —— & Ganguly, S. K., 113 (Mal.)
Chorine, V., 420, 422 (Mal.)
—— & Koechlin, D., 791 (Mal.)
——, with Marchoux, 546 (Lep.)
——, Prudhomme, R. & Koechlin, D., 130 (Mal.)
Chou, S., with Chang, (781) (Am.)
Choucroun, N. & Peltier, M., 554 (Lep.)
Chowdhury, S. C., with Ukil, (148) (Mal.)
Chowdhury, M. U., with Measham, 804 (Mal.)
Chowhan, J. S., with Chopra, 379 (Sn.)
Christison, M. H., 29 (S.S.)
Christophers, R., 821 (Bl.)
Chu, H. J., with Yao, 619 (Hel.)
Chu, P. J., with Yu, Wang & Tao, 619 (Hel.)
Chun, J. W. H., 496 (H.S.), 761 (Chl.)
Chung, H., 87, 485 (K.A.)
——, with Yen, 91 (K.A.)
Chwatt, L., 132 (Mal.)
Ciancas Rodriguez, R., (820) (Mal.)
Ciaudo, P., with Giraud, 88 (K.A.)
Ciferri, R. & Redaelli, P., 219 (Misc.)
——, with ——, 181 (Der.), 219, 905 (Misc.)
Cilento, R. W., 510 (Misc.)
Ciuca, M., Balteanu, J. & Constantinescu, N., 559, 565 (Fev.)
——, Franke, M. & Alexa, E., with Agapi, C., Pupu, E. & Manoliu, E., 745 (Mal.)
——, with Slatineanu, Balteanu, Alexa, E., Alexa, I., Francke & Rugina, 411 (Mal.)
Clarebout, G., with Mouchet, van Hoof, Duren, Fornara, Henry & Henrard, 280 (Y.F.)
Clark, H. C., 107 (Mal.), 512 (Misc.)
——, with Grayson & Martin, (532) (Misc.)
——, with Komp, 434, 784 (Mal.)
Clarke, L. P., with Findlay, 289, 290, 590 (Y.F.)
——, with —— & Hewer, 291 (Y.F.)
Clarkson, L. M., (146) (Mal.)
Clements, F. W., (532) (Misc.)
Clemesha, W. W., 399 (Mal.)
Clunie, T. & Eva, A., 519 (Misc.)
Cluzet, with Grimes & Minec, 869 (Lep.)
Cochrane, R. G., 538, 541, (873) (Lep.)
Cohen, H., 899 (Oph.)
Colarizi, A., 481 (K.A.)
Colas-Belcour, J., 223 (Misc.)
Cole, H. I., 548 (Lep.)
Coleman, G. E., 299 (R.F.)
Colichón, H., with Franco, 600 (R.B.F.)
Collignon, E., 99 (Mal.)
Collins, R. K., 116 (Mal.)
——, with Drensky, 106 (Mal.)
Comaroff, R., with Kligler, 715 (S.S.)
Compagnini, G., 136 (Mal.)
Conforto, A. V., with Dopff, (170) (Fev.)
Congo Belge, 501, 503 (Misc.)
Connery, J. E., with Curran & Goldwater, (674) (Misc.)
Connolly, M., 241 (Hel.)
Constantinesco, N., with Ciuca & Balteanu, 559, 565 (Fev.)
——, with Parvulescu & Boeriu, 750 (Mal.)
Conte, M., with Rathery & Dérot, (493) (K.A.)
Contos, B., with Caminopetros, Pheloukis & Pagonis, 575 (Fev.)
Copeland, A. J., 733, (752) (Mal.)
Cordiner, G. R. M., with Low, 672 (Misc.)
Cordoliani, S., with Sautet, 406 (Mal.)
Corkill, N. L., 465 *bis* (Pel.)
Cormack, R. P., (532) (Misc.)
Corman, 826 (Bl.)
Corman, A., 743 (Mal.)
Cornejo, A., (371) (S.S.)
Corradetti, A., 443 (Mal.)
Corson, J. F., 30, 33, 352 *bis*, 353, 363, 709, 710 (S.S.)
Cort, W. W., with Foster, 641 (Hel.)
Corteggiani, E., with Gautrelet & Halpern, 379 (Sn.)
Cossa, with Augier, 576 (Fev.)
Costa Mandry, O., with Suarez, (675) (Misc.)
Coulogner, 81 (K.A.)
Courel Fernández, M., (444) (Mal.)
Coutinho, A., 894 (Y. & S.)
Covell, G., 428, 441 (Mal.)
—— & Baily, J. D., 93, 399 (Mal.)
Crabtree, J. A., with Meleney, 107 (Mal.)
Craig, C. F., 105, (146) (Mal.), (198) *bis* (Am.), 301 (B.R.), (915) (Misc.)
Crane-Lillie, M. & Rhoads, C. P., 469 (Pel.)
Creagh, E. P. N., (198) (Am.)
Cross, S. X., with Foster, 265 (Hel.)
——, with Landsberg, 641 (Hel.)
Cruz, M. C., 872 *bis* (Lep.)
Cruz, W. O., 261, 262, 640 (Hel.)
Cuboni, E., 379 (Sn.)
Culbertson, J. T. & Strong, P. S., 360 (S.S.)
Cullom, M. M., 896 (Oph.)
Cumming, J. G., 167 (Fev.)
da Cunha, A. M., 582 (Fev.)
Curran, J. A., Connery, J. E. & Goldwater, L. J., (674) (Misc.)

D

Damboviceanu, A. & Soru, E., 461 (Chl.)
Dàng-Hanh-Kiên, 400 (Mal.), 827 (Bl.)
Datta, S. K., with Banerjee, 764, (772) (Chl.)
Dau, H., with Pijper, 154, 561 (Fev.)
Davies, J. R., 672 (Misc.)
Davey, T. H., with Gordon & Peaston, 237 (Hel.)
Davidson, H. S., with Riesman, 4 (Bb.)
Davis, G. E., 569 (Fev.)
Davis, N. C., 126 (Mal.), 648 (Hel.)
Dawson, J. R., Jr., with Webster, 608 (Rab.)
De, M. N. & Chatterjee, K. D., 272 (Hel.), 490 (K.A.)
DeBakey, M. E., with Hinman & Faust, 277 (Hel.)
DeCoursey, E., 363 (S.S.)
Decourt, J. & Ariès, C., 492 (K.A.)

Decourt, P., 785, 786 (Mal.)
Degotte, J., with Dubois, 341 (Lep.)
——, with —— & Westerlinck, 546, 870, 873 (Lep.)
Deimer, J. H., 835 (B.R.)
De la Barrera, J. M. & Arzeno, M., 447 (Pl.)
De la Camara, P., (370) (S.S.)
Delanoë, E., 869 (Lep.)
De la Plaza, G., Vegas, M. & Gomez, B., 871 (Lep.)
Delbove, P. with Mesnard, 157 (Fev.)
——, with Ragiot, 157, 562 (Fev.)
——, with —— & Tran-van-Tu, 157 (Fev.)
Del Rosario, F., with Shah & Rozeboom, 425 (Mal.)
Del Toro Cano, F., 539 (Lep.)
Demanez, M. L., 863 (Lep.)
Demidowa, A. J., with Bogojawlenski & Melikowa, 482 (K.A.)
Demidowa, L. W., with Kritschewski, 410 (Mal.)
Dempsey, J. G., with Thompson & Toombs, (148) (Mal.)
Denecke, K. & Malamos, B., 423 (Mal.)
Denney, O. E., 331, 338 (Lep.)
Deprat, 455 (Pl.)
Dérot, M., with Rathery & Conte, (493) (K.A.)
Deschiens, R., 192 *ter*, 778 (Am.)
Des Essarts, J. Q. & Lefrou, G., 339 (Lep.)
——, with ——, 861 (Lep.)
Desnos, E. H., 877 (Y.F.)
——, with Stefanopoulo & Mollaret, 290 (Y.F.)
Deutsch, B., 832 (Bl.)
Devasagayam, A., (532) (Misc.)
Dhont, C. M., Schüffner, W. A. P. & Snijders, E. P., 288 (Y.F.)
Dias, E., 363, 365, 722 (S.S.)
——, with Villela, 366 *bis* (S.S.)
Dinger, J. E., 165 (Fev.)
Diniz, O., 856 (Lep.)
Dios, R. L., with Fülleborn & Zuccarini, 637 *bis* (Hel.)
——, de Sommerville, E. T. W., Bonacci, H., Aldao, A. & Barba, R., 511 (Misc.)
Dirckze, H. A., with Sweet, 269 (Hel.)
Disini, D., with Lagrosa & Tiong, 868 (Lep.)
Dixon, H. B. F. & Smithers, D. W., 631 (Hel.)
Djaparidse, P. S., 743 (Mal.)
Do Amaral, A., Apantes, J. B. & da Fonseca, F., 217 (Misc.), 383 (Sn.)
Dobell, C., 658 (Misc.)
Dobradin, P. M. & Skorodumov, A., 451 (Pl.)
Dobreff, M., 216 (Misc.)
Dodd, K. & Tompkins, E. H., 219 (Misc.)
Dogra, J. R., (146) (Mal.)
Donatelli, L., (532) (Misc.)
Donatien, A. & Lestoquard, F., 491 (K.A.)
——, with Parrot, 484 (K.A.)
Doorenbos, W., 457, 763 (Chl.)
Dopff, C. S. & Conforto, A. V., (170) (Fev.)
Dorolle, Chaussinand, R. & Tran-van-Tam, 608 (Rab.)
Dorolle, P. & Ngo-Quang-Ly, 545, (554) (Lep.)
——, —— & Tran-van-Tam, 346 (Lep.)
Dostrovsky, A., 89 (K.A.)
Dove, W. E. & Hall, D. G., 662 (Misc.)
Draganesco, S., with Marinesco, 179, 617 (Rab.)
Dragomir, L., with Urechia, (675) (Misc.)
Drensky, K. & Collins, R. K., 106 (Mal.)
Dreosti, A. O., 494 (H.S.)
Dreyfus, M., (915) (Misc.)
Dreyfuss, A., 507 (Misc.)
van Driel, B. M., 508 (Misc.)
Drinker, C. K., with Homans & Field, 273 (Hel.)
Dubois, A. & Degotte, J., 341 (Lep.)
——, Westerlinck, H. & Degotte, J., 546, 870, 873 (Lep.)
Dudley, S. F., 283 (Y.F.)
Duke, H. L., 8, 10, 31, 32, 688, 690, 691, 708 (S.S.), 785 (Mal.)
——, Mettam, R. W. M. & Wallace, J. M., 33 (S.S.)
Dumont, R., 687 (S.S.)
Dunn, E. E., 377 *bis* (Sn.)
Dunn, L. H., 38 *bis* (S.S.), (674), 667 (Misc.), 806 (Mal.)
Dünner, L., Hirschfeld, H. & Geraldy, M., (49) (Sp.)
Dupoux, R., with Villain & Marini, 805 (Mal.)
Duprat, (853) (Pl.)
Dupuy, 682 (S.S.)
Durand, R., 164 *bis* (Fev.)
—— & Hombourger, K., 565 (Fev.)
——, with Laigret, 164 (Fev.), 571 (Fev.)
Duren, A., 288 (Y.F.)
——, with Mouchet, van Hoof, Fornara Clarebout, Henry & Henrard, 280 (Y.F.)
—— & Van den Branden, F., 349 (S.S.)
Durieux, C., with Mathis & Advier, 288 (Y.F.)
——, with —— & Laigret, 284 (Y.F.)
du Toit, R. M., with Nieschulz, 663 (Misc.)
Dutt, A., with Chopra & Ghosh, (532) (Misc.)
Dutta, N. C., (554) (Lep.)
Duval, C. W., (198) (Am.), 550 (Lep.)
Duvoir, M. E., with Brumpt & Sainton, (279) (Hel.)
Duwez, J., with van Nitsen, 305 (B.R.)
Dyer, R. E., 160 (Fev.)
Dyke, H. W., 539 (Lep.)

E

Earle, W. C., with Howard & Muench, 739 (Mal.)
Earnshaw, P. A., (198) (Am.)
Eaton, L. S., with Russell, 144 (Mal.)
Eaton, P., 423 (Mal.)
Economic Advisory Council, 677 (S.S.)
Edwards, J. T., 821 (Bl.)
Egypt, 233 (Hel.)
Egypt, Ministry of the Interior, 900 (Misc.)
Egyptian Government, 397 (Mal.)
Eichholtz, F., 747 (Mal.)
—— & Erhardt, A., 252 (Hel.)
Eilmann, H., 269 (Hel.)
Eisbach, L., 246 (Hel.)
Ejercito, A., 98, 816 (Mal.)
Ekblom, T., 812 (Mal.)
El Diwany, M. A. El M., 247 (Hel.)
Elliot, R. H., 898 (Oph.)
Ellis, M., 16 (S.S.)

Elmes, B. G. T., with Smith, 523 (Misc.)
Emara, 621 (Hel.)
Emerson, G. A., 343 (Lep.)
—— & Anderson, H. H., 347, 548 (Lep.)
——, —— & Leake, C. D., 549 (Lep.)
Engelbreth-Holm, J., with Lomholt, 866 (Lep.)
Enikolopov, S. K., with Chaikin, 734 (Mal.)
Epstein, E., with Tareev, Bolotina, Gontaeva, & Raskin, 111 (Mal.)
Epstein, H. & Silvers, I. L., 158 (Fev.)
——, Turewitsch, E. I. & Exemplarskaja, E. W., 161 (Fev.)
Erhardt, A., 252 (Hel.)
——, with Eichholtz, 252 (Hel.)
Escalar, G., with Pecori, 404 (Mal.)
Eskey, C. R., 446 (Pl.)
Eskin, V. A., with Lisova, 724 (Mal.)
Eskridge, L., with Hegner, 659 *bis* (Misc.)
Esmenard, J., with Joyeux & Sédan, 899 (Oph.)
Esposito, G., 774 (Am.)
Estrade, F., 846 (Pl.)
——, with Girard, 454 (Pl.)
Eva, A., with Clunie, 519 (Misc.)
Evans, A. C., 666 (Misc.)
Evans, A. M., 438 (Mal.)
—— & Leeson, H. S., 804 (Mal.)
Exemplarskaja, E. W., with Epstein & Turewitsch, 161 (Fev.)

F

Faccioli, D., 815 (Mal.)
Façon, E., with Marinesco, 617 (Rab.)
Fairley, N. H., 373 (Sn.)
—— & Bromfield, R. J., 210 *bis*, 828 (Bl.)
——, with Low, 45 (Sp.)
——, with Mackie, 46 (Sp.)
Fakhry, A., 236 *bis* (Hel.)
Fan, P. L. & Scott, A. V., 483 (K.A.)
Far Eastern Association of Tropical Medicine, 761 (Chl.), 758 (B.R.), 841 (Pl.)
Faria, A., with Braga, 608 (Rab.)
Farinaud, E., 143 *bis* (Mal.)
Farinaud, M. E., 786 (Mal.)
Farmakadis, C., (781) (Am.)
Fast, J., 508 (Misc.)
Faure-Brac, with Augier, 490 (K.A.)
Faust, E. C., (198) (Am.)
——, with Hinman & DeBakey, 277 (Hel.)
—— & Hoffman, W. A., 245 (Hel.)
——, ——, Jones, C. A. & Janer, J. L., 244 (Hel.)
——, Jones, C. A. & Hoffman, W. A., 625 (Hel.)
—— & Kagy, E. S., 190, 191 (Am.)
——, with Riley & Griffitts, 106 (Mal.)
——, Scott, L. C. & Swartzwelder, J. C., 777 (Am.)
——, Wells, J. W., Adams, C. & Beach, T. D., 267 (Hel.)
Faz Tabío, H., 257 (Hel.)
Federated Malay States, 138 (Mal.)
Feemster, R. F., 193 (Dys.)
Feijoó, E. J. C., with Raimondi, 36 (S.S.)
Feng, C. T. & Cheng, C. L., (554) (Lep.)
Feng, H. H., 255 (Hel.), 475 (Oph.)
Feng, L., 647 (Hel.), 802 (Mal.)
Fermoselle Bacardi, J., with Kourí & Basnuevo, 628 (Hel.)
Fernandez, J. M. M. & Schujman, S., 869 (Lep.)
Fernando, S. E., 274 (Hel.), 475 (Oph.)
Féron, J., 545 (Lep.)
Ferreira, B. G., (444) (Mal.)
Ferreira, J. C., 795 (Mal.)
Ferris, G. F., 913 (Misc.)
Ficacci, L., (752) (Mal.)
Field, J. W., 114 (Mal.)
—— & Kandiah, M., 416 (Mal.)
Field, M., with Homans & Drinker, 273 (Hel.)
Fiessinger, N., 492 (K.A.)
Fillion, H. & Millischer, P., 658 (Misc.)
Findlay, G. M., 285, 286 (Y.F.)
—— & Brown, H. C., 120 (Mal.)
—— & Clarke, L. P., 289, 290, 590 (Y.F.)
——, Hewer, T. F. & Clarke, L. P., 291 (Y.F.)
—— & Stern, R. O., 593 (Y.F.)
Fine, J., 36 (S.S.)
Fiol, H., with Puente, (555) (Lep.)
Fiorentino, A., with Paradiso, 534 (B.R.)
Fischer, F. P. & Fischl, V., 222 (Misc.)
Fischer, O., (781) (Am.)
Fischl, V., 702 (S.S.)
——, with Fischer, 222 (Misc.)
—— & Fischl, L., 358 (S.S.)
—— & Singer, E., 355, 701, 708 (S.S.)
——, with ——, 355, 703 (S.S.)
——, with —— & Kotrba, 24 (S.S.)
Fisher, A. C., 239, 247 (Hel.)
Fisk, R. T., with Hoyt & Thienes, 618 (Rab.)
Fitte, O. E., 721 (S.S.)
Fitzgerald, G. H. & Gupta, P. K. D., 55 (Y. & S.)
Fivoli, F., 58 (Y. & S.)
Fletcher, W., 410 (Mal.)
Flinker, R., (470) (Pel.)
Flu, P. C., (853) (Pl.)
——, with Hulshoff, (674) (Misc.)
Foley, H. & Parrot, L., 397 (Mal.)
Fons Diaz, O., (146) (Mal.)
da Fonseca, F., with Do Amaral & Arantes, 217 (Misc.)
——, with —— & Arantes, 383 (Sn.)
Forkner, C. E. & Zia, L. S., 479 (K.A.)
——, with ——, 482, 483 (K.A.)
Fornara, L., with Mouchet, van Hoof, Duren, Clarebout, Henry & Henrard, 280 (Y.F.)
Fort, M. A., (146) (Mal.)
Foster, A. O. & Cort, W. W., 641 (Hel.)
—— & Cross, S. X., 265 (Hel.)
—— & Landsberg, J. W., 259 (Hel.)
Foster, J. W., with Spector & Glover, (773) (Am.)
Fourest, with Gimbert, Andreoli & Houssiaux, 168 (Fev.)
Fox, H., 90 (K.A.)
—— & Knott, J., 545 (Lep.)
Fradkin, W. Z., (198) (Am.)
Francke, M., with Slatineanu, Balteanu, Sibi, Nitzulescu, Cantacuzino, Paraschivescu, Veit & Lupu, 469 (Pel.)
——, with Slatineanu, Ciuca, Balteanu, Alexa, E., Alexa, I. & Rugina, 411 (Mal.)
Franco, E. E., 480 (K.A.)

Franco, J. J. & Colichón, H., 600 (R.B.F.)
Francois, J., 471 (Oph.)
Franke, M., with Ciuca & Alexa & Agapi, C., Pupu, E. & Manoliu, 745 (Mal.)
Fraser, N. D., 872 (Lep.)
Frawley, J. M. & Ginsburg, H. M., 915 (Misc.)
——, with ——, 915 (Misc.)
Freeman, A. R. & Torres, A. N. (146) (Mal.)
Freeman, M. & Kellaway, C. H., 374 (Sn.)
——, with Williams & Kennedy, 374 (Sn.)
Freund, H. A. (198) (Am.)
Freund, L., 256 (Hel.)
Freville, L. H. F., 345, 547 (Lep.)
Frey, S., 382 (Sn.)
Fróes, H. P., (147), 423 (Mal.), 482 (K.A.), 671 (Misc.), 603 (B.R.)
Frohn, W., 584 (Fev.)
Frugoni, C., (582) (Fev.)
Frye, W. W. & Meleney, H. E., 779 (Am.)
——, with ——, 190, 779 (Am.)
Fujibayashi, M., 361 (S.S.)
——, with Komiya, (43) (S.S.)
Fülleborn, F., Dios, R. L. & Zuccarini, J. A., 637 *bis* (Hel.)
Funayama, J. I., 177 *bis* (Rab.)
Funk, W. H., (170) (Fev.)

G

Gaafar, M., with Azmy & Noshokati, 527 *bis* (Misc.)
Gaignaire, 743 (Mal.)
Galavielle, R., with d'Oelsnitz & Raybaut, (493) (K.A.)
Galinier, G., 56 (Y. & S.)
Gallardo, V. P., (279) (Hel.)
Galliard, H., 42 (S.S.), 813 (Mal.)
——, with Brumpt, 486 (K.A.)
—— & Sautet, J., 403, (445) (Mal.)
Galli-Valerio, 382 (Sn.)
Galt, C. M. & Yawt, N., 334 (Lep.)
Gambrell, E., with Huff, 119 (Mal.)
Ganguli, S. K., with Chopra, 788 (Mal.)
——, with —— & Roy, 787 (Mal.)
——, with —— & Sen, 113 (Mal.)
Gan Sing Bie, with Soetjahjo, 3 (Bb.)
Garcia, E. Y., with Africa, 776 (Am.)
García Robin, A., with Patiño Mayer, (782) (Am.)
Gardiner, M. L., with Miller, 255 (Hel.)
Gardner, A. D. & Venkatraman, K. V., 461, 769 (Chl.)
Gaschen, 133 (Mal.)
Gaschen, H., 403, 801, 802 *bis* (Mal.)
Gaud, M., with Blanc, 570 (Fev.)
Gauthier, H., 243 (Hel.)
Gautier, C. & Bissery, 600 (R.B.F.)
Gautrelet, J. & Halpern, N., 378 (Sn.)
——, —— & Corteggiani, E., 379 (Sn.)
Gay, M. A. P., with Varela, 160 (Fev.)
——, with —— & Aguayo, 564 (Fev.)
Geay, M., 902 (Misc.)
Gelfand, B. B., with Appelbaum, 108 (Mal.)
Gentilucci, A. S., 608 (Rab.)
Geoghegan, A. J., (370) *bis* (S.S.)
Geracitano, A., with Castronuovo, 422 (Mal.)
Geraldy, M., with Dünner & Hirschfeld, (49) (Sp.)
Ghose, A. K., 216 (Misc.)
Ghosh, B. M., 832 (Bl.)
Ghosh, B. N., 918 (B.R.)
—— & Nath, M. C., 422 (Mal.)
——, with Sinton, 127 (Mal.)
——, with Wats, 749 (Mal.)
Ghosh, H., 459 (Chl.)
Ghosh, L. M., with Acton, 184 (Der.)
Ghosh, S., with Chopra, 528 (Misc.)
——, with —— & Dutt, (532) (Misc.)
Gibson, D., with Strickland, 140 (Mal.)
Giglioli, G., 214 (Bl.)
Gilbert, E. W. & Stewart, C. M., 673 (Misc.)
Gil Collado, J., with Cartaña Castella, 307 (B.R.)
Gilks, J. L., 83 (K.A.)
Gill, D. G., with Baker & McAlpine, 564 *bis* (Fev.)
Gillan, R. U., 71 (Misc.)
Gille, R., with Benhamou, 791, 793 (Mal.)
Gillier, M. R., 552 (Lep.)
Gillier, R., 340 (Lep.)
Gilmour, C. C. B., 450 (Pl.)
Gimbert, Andreoli, Houssiaux & Fourest, 168 (Fev.)
Ginandes, G. J., 493 (K.A.)
Ginsburg, H. M., with Frawley, 915 (Misc.)
Giordano, A., 534 (B.R.)
Giordano, M., 191 (Am.), 520 (Misc.), 575 (Fev.)
Giovannola, A., 122, 128, (445), 737 (Mal.)
Girard & Paulicevich, 600 (R.B.F.)
Girard, G., 452, 850 (Pl.)
—— & Estrade, F., 454 (Pl.)
—— & Robic, J., (456) (Pl.)
Giraud, P., 480, 482, 484 *bis* (K.A.)
—— & Ciaudo, P., 88 (K.A.)
—— & Poursines, Y., 84 (K.A.)
—— & Vigne, P., 84 (K.A.)
Girges, R., 257 *bis*, (279,) 636 (Hel.)
Giroud, P. & Haber, P., 568 (Fev.)
——, with Nicolle, 557, 558 *bis*, 559, (582) (Fev.)
Giunta, G., (834) (Bl.)
Glover, N. G., with Spector & Foster, (773) (Am.)
Gnedina, M., with Podyapolskaya, 232 (Hel.)
Gnezdilov, V., 780 (Am.)
Gobert, E., 243 (Hel.), 846 (Pl.)
——, with Anderson, 243 (Hel.)
Godbole, G. B., with Vengsarkar & Raghavan, 228 (Misc.)
Godinho, R., with Prado, (753) (Mal.)
Gohar, M. A., 851 (Pl.)
Goinard, P., with Catanei, 182 (Der.)
Goldblatt, I., 825 (Bl.)
Goldie, H., 355 (S.S.)
Goldwater, L. J., with Curran & Connery, (674) (Misc.)
Golob, M., 634 (Hel.)
Goltman, D. W., with Mitchell, (753) (Mal.)
Gomes, J. M., 331 (Lep.)
Gomez, B., with De la Plaza & Vegas, 871 (Lep.)
Gomez, J. M., 341 (Lep.)
Gontaeva, A., with Tareev, Bolotina, Raskin & Epstein, 111 (Mal.)

Gonzaga, A. G. & Leão, A. E. A., 182 (Der.)
Gonzales, H. D., 180 (Rab.)
González, J. O., with Bachman & Molina, 268 (Hel.)
Gorchowa, E. L., with Sinelnikow, Moldawskaja-Kritschewskaja, Althausen & Gritzay, 792 (Mal.)
Gordon, R. M., 295 (Y.F.)
——, Davey, T. H. & Peaston, H., 237 (Hel.)
Gorgas Memorial Institute, (532) (Misc.)
Gouget, R., 99 (Mal.)
Gourry, N., with Riou & Hussenet, 112 (Mal.)
Gourvil, E., 538 (Lep.), 589 *bis* (Y.F.)
Gow, W. H., 473 (Oph.)
Grace, A. W., 271 (Hel.)
Graham, G. L., 269 (Hel.)
Grall, G., (724) (S.S.), 881 (Y.F.)
Grams, H., 658 (Misc.)
Grant, A. M. B., 330 (Lep.)
Grasset, E., with Pirie, 852 (Pl.)
Grau, C. A., with Beretervide, 776 (Am.)
Grayson, C. T., Martin, F. & Clark, H. C., (532) (Misc.)
Grayson, W. B., (147) (Mal.)
Greco, Z., 91 *bis* (K.A.)
de Greef, R., (227) (Misc.)
Green, H., with Nadler & Rosenbaum, 216 (Misc.)
Green, R., 391 (Mal.)
Greenfield, G., 734, (752) (Mal.)
Greenway, D., with Castex, (198) *bis* (Am.)
Greig, E. D. W., Hendry, E. B. & van Rooyen, C. E., 131 (Mal.)
——, van Rooyen, C. E. & Hendry, E. B., 129 *ter* (Mal.)
Greval, S. D. S., 384 (Sn.)
Griffith, G., 661 (Misc.)
Griffitts, T. H. D., 106 (Mal.)
——, with Hanson & Boyd, 735 (Mal.)
——, with Riley & Faust, 106 (Mal.)
Grigaut, A., with Marchal & Soulié, (279) (Hel.)
Grigorowski, A. M., with Kritschewski, Magidson & Halperin, 419 (Mal.)
Grikurow, W., 450 (Pl.)
Grillo, J. & Krumeich, R., 298 (R.F.)
Grimard, L., with Nattan-Larrier, 485 (K.A.)
Grimard-Richard, L., with Nattan-Larrier, 85 *ter*, 87, 484 (K.A.)
——, with —— & Nouguès, 85 (K.A.)
Grimes, C., Cluzet & Minec, 869 (Lep.)
Grinberg, A., with Tudoranu & Herescu, 128 (Mal.)
Gritzay, A. A., with Sinelnikow, Moldawskaja-Kritschewskaja, Gorchowa & Althausen, 792 (Mal.)
Grizaud, H., 171 (Fev.)
de Groat, A., with Thompson, (873) (Lep.)
Gross, M., 197 (Dys.)
Grossmann, J., with Jelin & Linetzkaja, 161 (Fev.)
Gruber, G. B., (655) (Hel.)
Guardabassi, M., 609 (Rab.)
Guccione, F., (147) (Mal.)
Guerrieri, T., (348) (Lep.)
Guerrini, F. Z., with Mazza, 36 (S.S.)
Guillerm, J., Banos, M. & Nguyen-Van-Lien, 342 (Lep).
Gulbransen, R., with Browning, 28, 705, 706 (S.S.)
——, with —— & Cappell, 30 (S.S.)
Gupta, B. M. D., 221 (Misc.)
——, with Chopra & Roy, 412 (Mal.)
——, with Knowles, 222 (Misc.), 799 (Mal.)
Gupta, P. K. D., with Fitzgerald, 55 (Y. & S.)
Gutierrez-Solano, with Solana (873) (Lep.)
Guy, R., (445) *bis* (Mal.), 620 (Hel.)
——, with Monier & Ros, 401 (Mal.)
Guzewič, A. W., 906 (Misc.)
Guzewitsch, A. W. & Podoljan, W. J., (915) (Misc.)

H

Haber, P., with Giroud, 568 (Fev.)
Hackett, C. J., 891 (Y. & S.)
Hackett, L. W., 138 (Mal.)
—— & Missiroli, A., 809 *bis* (Mal.)
Hall, D. G., with Dove, 662 (Misc.)
Hall, G. R., 202 (Bl.)
Hall, M. C., 233 (Hel.)
Haller, H. L., with Campbell, Sullivan & Smith, 663 (Misc.)
Hallinan, T. J., 637 (Hel.)
Halperin, E. P., with Kritschewski, Magidson & Grigorowski, 419 (Mal.)
Halpern, N., with Gautrelet, 378 (Sn.)
——, with —— & Corteggiani, 379 (Sn.)
Hamel, J. & Chavarot, M., (445) (Mal.)
Hancock, G. L. R., 661 (Misc.)
Handler, B. J., 360 (S.S.)
Hanifah, A., (834) (Bl.)
Hanson, H., (147) (Mal.)
——, Boyd, M. F. & Griffitts, T. H. D., 735 (Mal.)
Happold, F. C., with Boxhall & Lloyd, 222 (Misc.)
Harbhagwan, with Chand, 800 (Mal.)
Hargrove, M. D., (781) (Am.)
Harrower, G., 862 (Lep.)
Harwood, P. D., 237 (Hel.)
——, with Lamson & Brown, 237 (Hel.)
——, with Meleney, 668 (Misc.)
Hasle, G., with Vaucel, 566 (Fev.)
Hassan, A. & Betashe, M., 250 (Hel.)
—— & Salah, M., 621 (Hel.)
——, with ——, 248 (Hel.)
Hasselmann, C. M., 185 (Der.), 205 (Bl.), 893 (Y. & S.)
Hassko, A., 706 *bis* (S.S.)
Hauer, A., (752) (Mal.)
Hauser, W., 498 (C.Bu.)
Hautefeuille, J., (279) (Hel.)
Hayashi, F., 334 (Lep.)
Hayashi, N., Matsuoka, S., Kato, T. & Okamoto, N., 169 (Fev.)
Hayes, G. H., 185 (Der.)
Haythornthwaite, R. A., with Morison & Rice, 460 (Chl.)
Hecht, G., 747 (Mal.)
Hegler, C. & Nauck, E. G., 77 (B.R.)
Hegner, R., 220, 223, 224 (Misc.), (781) (Am.)
—— & Eskridge, L., 659 *bis* (Misc.)
Helfferich, W. M. G., 96 (Mal.)
Helman, J., 564 (Fev.)

Helpern, M., 405 (Mal.)
Hemenway, R. V., (198) (Am.)
Hemming, F., 677 (S.S.)
Henderson, L. H., 143 (Mal.)
Hendry, E. B., with Greig & van Rooyen, 129 *ter*, 131 (Mal.)
Hennessey, R. S. F., 156 (Fev.)
Henrard, C., 369 (S.S.)
——, with Mouchet, van Hoof, Duren, Fornara, Clarebout & Henry, 280 (Y.F.)
——, with Vincke, 100 (Mal.)
Henry, A. F. X., 132, (445), (752), 790 (Mal.)
Henry, E., with Mouchet, van Hoof, Duren, Fornara, Clarebout & Henrard, 280 (Y.F.)
Henry, X., 132 (Mal.)
Henry Lester Institute of Medical Research, 65 (Misc.)
Herbert, H., 896 (Oph.)
Herescu, D., with Tudoranu & Grinberg, 128 (Mal.)
Herms, W. B., (674) (Misc.)
——, Bailey, S. F. & McIvor, B., 914 (Misc.)
Hertig, A. T., 226 (Misc.)
Hesterlow, A. M. V., 453 (Pl.)
Hetsch, H., with Kolle, 75, 307 (B.R.)
Hewer, T. F., 53 (Y. & S.)
——, with Findlay & Clarke, 291 (Y.F.)
Hicks, E. P. & Chand, D., 749 (Mal.)
Hill, R. B., 439 (Mal.)
—— & Olavarria, J., (147) *bis* (Mal.)
——, with ——, 815 (Mal.)
——, —— & Rivera, J., 814 (Mal.)
——, with Rivera, 814 (Mal.)
Hilmy, I. S., 621 (Hel.)
Hingst, H. E., 109 (Mal.)
Hinman, E. H., 106 (Mal.)
——, Faust, E. C. & DeBakey, M. E., 277 (Hel.)
—— & Kampmeier, R. H., 671 (Misc.)
Hinshaw, H. C. & Showers, E. M., 188 (Am.)
Hirano, N., 174 (Rab.)
Hirayama, S., 187 (Am.)
Hirschfeld, H., with Dünner & Geraldy, (49) (Sp.)
Hisamochi, Y., 865 (Lep.)
Hiyeda, K., 509, 903 (Misc.)
Hoang-Pho, 535 (Lep.)
Hoare, W. W., 471 (Oph.)
Hoffman, W. A., with Faust, 245 (Hel.)
——, with ——, & Jones, 625 (Hel.)
——, with ——, —— & Janer, 244 (Hel.)
Hoffmann, C. C., 101, 816 (Mal.)
Hoffmann, J. M., Mertens, W. K. & Snijders, E. P., 171 (Fev.)
Hoffmann, W. H., (595), (882) (Y.F.), 789 (Mal.), 859 (Lep.)
—— & Baez, P. R., 551 (Lep.)
—— & Ramos Baez, P., (555) (Lep.)
Hogue, M. J., 191 (Am.)
Holden, H. F., 380 (Sn.)
Hollenbeck, E. S., 538 (Lep.)
Homans, J., Drinker, C. K. & Field, M., 273 (Hel.)
Hombourger, K., with Durand, 565 (Fev.)
Honess, R. F., with Owen & Simon, 188 (Am.)
van Hoof, L., 503 (Misc.)
——, with Mouchet, Duren, Fornara, Clarebout, Henry & Henrard, 280 (Y.F.)
Hoops, A. L., 726 (Mal.)
Hopkins, H. O., 110 (Mal.)
Hoskins, M., 294 (Y.F.)
Houdemer, E., with Phisalix, 372 (Sn.)
Houssiaux, with Gimbert, Andreoli & Fourest, 168 (Fev.)
Houwer, A. W. M. & Mingelen, R., 898 (Oph.)
Hoverson, E. T. & Petersen, W. F., 217 (Misc.)
Howard, H. H., Earle, W. C. & Muench, H., 739 (Mal.)
Hoyt, A., Fisk, R. T. & Thienes, C. H., 618 (Rab.)
Hsu, S. C., with Yao & Ling, 619 *bis* (Hel.)
Hu, S., with Toumanoff, 437 (Mal.)
Hu, S. M. K., 270, 647 (Hel.)
——, with Robertson, 99 (Mal.)
—— & Yen, C. H., 646 (Hel.)
Huang, K. K., with Yang, 466 (Pel.)
Huard, P. & Renucci, N., 524 (Misc.)
Hudson, E. H., 891 (Y. & S.)
Huff, C. G. & Gambrell, E., 119 (Mal.)
Hughes, T. P., 293 (Y.F.)
——, with Bauer, 593 (Y.F.)
——, with Theiler, 590 (Y.F.)
Huizenga, L. S., 535, (555), 858 (Lep.)
Hulshoff, A. A., 626 (Hel.)
—— & Flu, P. C., (674) (Misc.)
Hulst, L. A., with Brester, (470) (Pel.)
Hurst, E. W., 175 (Rab.)
Hussein, A. G., (456) (Pl.)
Hussenet, S., with Riou & Gourry, 112 (Mal.)

I

Ichihara, T., 864 (Lep.)
Iglesias, D., 88 (K.A.)
Ignacio, J., with Lagrosa, 868 (Lep.)
Ikeda, K., (781) (Am.)
Ilvento, 102 (Mal.)
Imagawa, Y., with Kawamura & Ito, 578 (Fev.)
Impallomeni, R., (674) (Misc.)
International Convention for Mutual Protection against Dengue Fever, Athens, (172) (Fev.)
Ioff, I. G., 463 (B.R.)
—— & Argyropulo, A., (674) (Misc.)
Irgang, S. & Alexander, E. R., 520 (Misc.)
Ishibashi, T., with Ota, 551 (Lep.)
——, with —— & Sato, (555) (Lep.)
Ishioka, H., with Morishita & Miyahara, 745 *bis* (Mal.)
Ishizu, S., with Tôyama, 544 (Lep.)
Iskandar, F., 773 (Am.)
Ismaïl, A., 785 (Mal.)
Israël, L., with Merklen, 492 (K.A.)
Issa, I. I., with Ashkar, (655) (Hel.)
Issajev, L. M., 653 *ter* (Hel.)
Itakura, T., 542, 863 (Lep.)
Ito, T., with Kawamura & Imagawa, 578 (Fev.)
Ivanić, M., 794 (Mal.)
Ivanitski, S., with Schultz, 646 (Hel.)
Ivy, A. C., with Reid, Anderson & Stubblefield, 194 (Dys.)
Iyengar, K. R. K., with Sankaran & Beer, 174 (Rab.)
Iyengar, M. O. T., 738 (Mal.), 844 (Pl.)

J

Jackson, C. H. N., 368 (S.S.)
Jackson, R. B., 726 (Mal.)
Jacono, I., 724 (S.S.)
——, with Castellani, 181 (Der.)
Jamaica, 637 (Hel.), 885 (Y. & S.)
Jame, L. & Aujaleu, E., 557 (Fev.)
James, C., 526 (Misc.)
James, J. F., 818 (Mal.)
James, S. P., 110, 127 (Mal.), 280, 874 (Y.F.)
——, Nicol, W. D. & Shute, P. G., 737 (Mal.)
Jamesson, (198) (Am.)
Jamison, R., 539 (Lep.)
Jamot, E., 684 (S.S.)
Jana, A. P., (445) (Mal.)
v. Jancsó, N. & v. Jancsó, H., 22, 358, 702, 703, 704 (S.S.)
—— & Novák, E., 596 (R.F.)
Janer, J. L., with Faust, Hoffman & Jones, 244 (Hel.)
Janisch, E., 669 (Misc.)
Jan-Kerguistel, A., 847 (Pl.)
Jansen, J., 175 (Rab.)
Jatsenko, F., 145 (Mal.)
Jazimirska-Krontowska, M. C., with Krontowsky, Savitska & Soliterman, 569 (Fev.)
Jelin, W., Linetzkaja, A. & Grossmann, J., 161 (Fev.)
Jerace, F., (147), 426 (Mal.)
Jesioran, R., 171 (Fev.)
de Jesus, P. I., with de Leon & Ramos, (532) (Misc.)
Jimenez Rivero, M., 858 (Lep.)
Jobling, B., 911 (Misc.)
Jofe, H., 205 (Bl.)
Johnston, H. M., with Turner & Saunders, 50 (Y. & S.)
Johnston, H. M., Jr., 887 (Y. & S.)
Jones, C. A., with Faust & Hoffman, 625 (Hel.)
——, with ——, —— & Janer, 244 (Hel.)
Jonesco, D., 610 (Rab.)
Jonnesco, D., 176 *ter*, 609 (Rab.)
——, with Proca & Bobes, 180, 618 (Rab.)
Jordan, P., 339 *bis* (Lep.)
Jorge, M. E., with Mazza, (43) (S.S.)
Jorge, R., 280 (Y.F.), 844, (853), (Pl.), 874 (Y.F.)
Joukov, N., Krassikova, V. & Rylovnikova, T., 114 (Mal.)
Jourdran, 897 (Oph.)
Journal of the Indian Medical Association, 6 (Bb.)
Journal of the Royal Army Medical Corps, 556 (Fev.), 631 (Hel.)
Journal of the Royal Naval Medical Service, 294 (Y.F.)
Joyeux, C., Sédan, J. & Esmenard, J., 899 (Oph.)
Jung Sun, C., with Yao, 726 (Mal.)

K

Kagy, E. S., with Faust, 190, 191 (Am.)
Kalabuchov, N., 849 (Pl.)
Kambayashi, T., 184 (Der.)
Kamimura, T., 636 (Hel.)
Kampmeier, R. H., with Hinman, 671 (Misc.)
Kan, Y., 187 (Am.)
Kandiah, M., with Field, 416 (Mal.)
Kang, T. I. & Wilson, R. M., 540 (Lep.)
Kao, Z. M., with Ku, 619 (Hel.)
Karve, J. V. & Sundararajan, E. R., 844 (Pl.)
Kasahara, S., Yoshida, S. & Okamoto, Y., 566 (Fev.)
Kato, T., with Hayashi, Matsuoka & Okamoto, 169 (Fev.)
Kauntze, W. H., 844 (Pl.)
Kawai, T., Nagayoshi, Y. & Koo, C., 187 (Am.)
Kawamura, M., 864 (Lep.)
Kawamura, R., Imagawa, Y. & Ito, T., 578 (Fev.)
Kawana, K., with Komiya & Tao, (655) (Hel.)
Keevill, A. J., 21 (S.S.)
Keil, E., 869 (Lep.)
Keilin, D., Tate, P. & Vincent, M., 912 (Misc.)
Kellaway, C. H., 374 *ter*, 377 (Sn.), 672 (Misc.)
——, with Freeman, 374 (Sn.)
Keller, A. E., 258, 646 (Hel.)
—— & Leathers, W. S., 230 (Hel.)
——, with ——, (279) (Hel.)
Kelley, W. H. & Sydenstricker, V. P., 740 (Mal.)
Kellogg, W. H., 847, (853) (Pl.)
Kemp, H. A., Moursund, W. H. & Wright, H. E., 296 (R.F.)
Kendrick, J. F., 258 (Hel.)
Kennedy, E., with Williams & Freeman, 374 (Sn.)
Kennedy, W. P., 528 (Misc.)
Kerim, M. A., 789 (Mal.)
Kernkamp, Y., with Occhino, 56 (Y. & S.)
Khakhaieva, V., with Okounevski, 662 (Misc.)
Khalil, M., 81, 89 (K.A.), 247, 624, (655) (Hel.) 398 (Mal.),
—— & Salah, M., 247 (Hel.)
Khambatta, K. D., (456) (Pl.)
Kharitonov, D. E., 815 (Mal.)
Khaw, O. K., 629, (655) (Hel.)
Kian, L. P., 576 (Fev.)
Kikuth, W., 227, (532) (Misc.), (752) (Mal.)
—— & Schönhöfer, F., (147), 420, (752) (Mal.)
King, E. F., 476 (Oph.)
Kingsbury, A. N., 417 (Mal.)
Kipritch, S., with Yatsenko & Paretskaya, 666 (Misc.)
Kirilow-Drenowsky, A., 746 (Mal.)
Kirk, J. B., 64 (Misc.)
Kirk, R., (445) (Mal.)
Kirschner, L., 452 (Pl.)
——, with Noosten & Vos, 73 (Misc.)
Kirwan, E. O'G., 473 (Oph.)
Kitabatake, E., (532) (Misc.), (781) *bis* (Am.)
Kitchen, S. F., with Boyd & Stratman-Thomas, 738 (Mal.)
Kleine, F. K. & Krause, M., 297 (R.F.)
Kligler, I. J. & Aschner, M., 163, 571 (Fev.)
—— & Comaroff, R., 715 (S.S.)

Klimentowa, A. A., 565 (Fev.)
Knott, J., with Fox, 545 (Lep.)
Knowles, R., 75 (B.R.)
—— & Basu, B. C., 398 (Mal.), 515 (Misc.), 598 (R.F.), 794 (Mal.)
—— & Gupta, B. M. D., 222 (Misc.), 799 (Mal.)
Kō, T., 169 (Fev.)
Kobashi, S., with Nakamura, 339 (Lep.)
Koechlin, D., with Chorine, 791 (Mal.)
——, with —— & Prudhomme, 130 (Mal.)
Kofoid, C. A., McNeil, E. & Bonestell, A., 222 (Misc.)
Koh, T. M., with Rose, (656) (Hel.)
Koidzumi, M., (655) (Hel.)
Kojima, T., Yamanaka, S. & Kyu, U. F., 166 (Fev.)
Koks, M. T., with van Veen, 5 (Bb.)
Kolle, W. & Hetsch, H., 75, 307 (B.R.)
Komiya, S. & Fujibayashi, M., (43) (S.S.)
Komiya, Y., Kawana, K. & Tao, S., (655) (Hel.)
Komp, W. H. W. & Clark, H. C., 434, 784 (Mal.)
Koo, C., with Kawai & Nagayoshi, 187 (Am.)
Kopaczewski, W., 491 (K.A.)
Kopciowska, L., 605 (Rab.), 879 (Y.F.)
——, with Nicolau, 173, 605 (Rab.)
——, with —— & Mathis, 293 (Y.F.)
Koressios, N. T., with Laignel-Lavastine & Würmser, 378 (Sn.)
——, with Vernes, 378 (Sn.)
Korovitski, L. & Artemenko, V., 232 (Hel.)
Kostareva, E., 91 (K.A.)
Kotrba, J., with Singer & Fischl, 24 (S.S.)
Kotter, G. F. & van den Berghe, L., 880 (Y.F.)
Kourí, P., Basnuevo, J. G. & Arenas, R., 628 *bis* (Hel.)
——, —— & Fermoselle Bacardí, J., 628 (Hel.)
Kouwenaar, 521 (Misc.)
Kouwenaar, W., Maasland, J. H. & Wolff, J. W., 521, (532 *bis*) (Misc.)
—— & Wolff, J. W., 578, 579 (Fev.)
——, with ——, 579 (Fev.)
Krainick, H., with Oesterlin, 236 (Hel.)
Kramer, H. F., (198) (Am.)
Krassikova, V., with Joukov & Rylovnikova, 114 (Mal.)
Krause, M., with Kleine, 297 (R.F.)
——, with Kunert, 362 (S.S.)
Krauss, W., (147) (Mal.)
Krishnan, K. V., 490 (K.A.), 832 (Bl.)
——, with Smith & Mukerji, 88 (K.A.)
Krishnaswamy, T. K., with Menon & Annamalai, 789 (Mal.)
Kritschewski, I. L. & Demidowa, L. W., 410 (Mal.)
——, Magidson, O. J., Halperin, E. P. & Grigorowski, A. M., 419 (Mal.)
—— & Pines, A. I., (752) (Mal.)
—— & Rubinstein, P. L., 793 (Mal.)
Krontowsky, A. A., Jazimirska-Krontowska, M. C., Savitska, H. P. & Soliterman, P. L., 569 (Fev.)
Kroó, H., 297 (R.F.)
Krumeich, R., with Grillo, 298 (R.F.)
Ku, D. Y., (655) (Hel.)
—— & Kao, Z. M., 619 (Hel.)
Kubo, M., (782) (Am.)
Kumm, H. W., 885, 886 (Y. & S.)
——, Turner, T. B. & Peat, A. A., 886 (Y. & S.)
Kundu, M. L., (227) (Misc.)
Kunert, H. & Krause, M., 362 (S.S.)
——, with Schilling, Schreck & Neumann, 43 *bis* (S.S.)
Kutcher, S., 145 (Mal.)
Kyu, K., 375 (Sn.)
Kyu, U. F., 166 (Fev.)
——, with Kojima & Yamanaka, 166 (Fev.)

L

Labernadie, V., 344 (Lep.)
Lacaux, J., 143 (Mal.)
Lacour, P. R., 129 (Mal.)
Lafleur, (894) (Y. & S.)
Lagrosa, M., Alonso, J. M., Tiong, J. O. & Paras, A., 547 (Lep.)
—— & Ignacio, J., 868 (Lep.)
——, Tiong, J. O. & Disini, D., 868 (Lep.)
Lai, D. G., 337, 535 (Lep.)
Laignel-Lavastine, Würmser, L. & Koressios, N. T., 378 (Sn.)
Laigret, J., 285 *bis*, 287, 879 (Y.F.)
—— & Durand, R., 164, 571 (Fev.)
——, with Mathis & Durieux, 284 (Y.F.)
——, with Nicolle, 880 (Y.F.)
Lal, C., with Smith, 83 (K. A.)
Lamb, A. R., 553 (Lep.)
Lambert, S. M., 60 (Misc.)
Lamborn, W. A., 909 (Misc.)
——, with Thomson, 68 (Misc.)
Lampe, P. H. J. & de Moor, C. E., 863 (Lep.)
Lamson, P. D., Brown, H. W. & Harwood, P. D., 237 (Hel.)
——, Molloy, D. M. & Brown, H. W., 635 (Hel.)
Landeiro, F., 788 (Mal.)
Landsberg, J. W. & Cross, S. X., 641 (Hel.)
——, with Foster, 259 (Hel.)
Lane, C., 274, 643, 644 (Hel.)
de Langen, C. D., 260 (Hel.)
—— & Storm, C. J., 418, 726, (753) (Mal.)
Langeron, M., 898 (Oph.)
——, with Brumpt, 183 (Der.)
Langton, E. A. C., 735 (Mal.)
Lapage, G., 634 (Hel.)
Lara, C. B. & de Vera B., 544, 862 (Lep.)
Large, D. T. M., 195 (Dys.)
—— & Sankaran, O. K., 195 (Dys.)
Lasnet, (147) (Mal.)
Lassablière, P. & Peycelon, A., 20, 42 (S.S.)
Latham, D. V., 526 (Misc.)
Lauda, E., 197 (Dys.)
Launoy, L., 353, 708 (S.S.)
—— & Ancelot, A., 354 (S.S.)
—— & Prieur, M., 696 (S.S.)
Laurel, A. G., 98 (Mal.)
Lawson, H. A., with Rhoads, Castle & Payne, 263 *bis* (Hel.)

Leake, C. D., with Emerson & Anderson, 549 (Lep.)
Leao, A. E. de A., 218 (Misc.)
Leão, A. E. A., with Gonzaga, 182 (Der.)
Lease, J. G. & Parsons, H. T., (532) (Misc.)
Leathers, W. S. & Keller, A. E. (279) (Hel.)
——, with ——, 230 (Hel.)
Le Chuiton, F. & Bourgain, M., 568 (Fev.)
Ledentu, G., 14 (S.S.)
Lee, H. S., 540 (Lep.)
Lee, Y., 256 (Hel.)
Leeson, H. S., 804 (Mal.)
——, with Evans, 804 (Mal.)
Lefrou, G. & des Essarts, J. Q., 861 (Lep.)
——, with ——, 339 (Lep.)
Legendre, F., 144, (445) (Mal.)
Léger, J. P., 449 (Pl.)
Leggate, J., 346 (Lep.)
——, Tiong, J. O. & Disini, D., 868 (Lep.)
Leiper, R. T., 759 (B.R.)
Leiva, L., 191 (Am.)
Lemaire & Ribère, 632 *bis* (Hel.)
Le Moult & Pirot, 231 *bis* (Hel.)
Lentjes, L. J. M., 169 (Fev.)
Lentz, W. J., with Barnes, Metcalfe & Martindale, 179 (Rab.)
de Leon, W., de Jesus, P. I. & Ramos, J. M., (532) (Misc.)
Lépine, P., 160, 565 (Fev.)
—— & Bilfinger, F., 161 (Fev.)
—— & Markianos, J., 546 (Lep.)
Leprosy in India, 856 (Lep.)
Leprosy Review, 328, 536 *bis*, 854 (Lep.)
Le Roux, J. J. du P., with Wade, 544 (Lep.)
Le Scouézec, 54 (Y. & S.)
Lester, H. M. O., 685 (S.S.)
Lestoquard, F., with Donatien, 491 (K.A.)
Levaditi, C., 607 (Rab.)
—— & Levaditi, J., 499 (C.Bu.)
——, Schoen, R. & Levaditi, J., 173 (Rab.)
——, Vaisman, A. & Paic, M., 298 (R.F.)
Levaditi, J., with Levaditi, C. & Schoen, 173 (Rab.)
Le-van-Phung, with Montel & Massari, 55 (Y. & S.)
Le-Van-Trien, with Bigot, 345 (Lep.)
Levine, J. & Marin, R. A., 627 (Hel.)
Levit, M. S., with Ruibinski, 819 (Mal.)
Levy, G., with Sézary & Bolgert, 342 (Lep.)
Lewis, D. J., 41 (S.S.), 134 (Mal.)
——, with Buxton, 369 (S.S.)
Lewis, E. A., 367 (S.S.)
Lewthwaite, R. & Savoor, S. R., 577 (Fev.)
Ley, J., with Baonville & Titeca, 693 (S.S.)
Lhérisson, C., 62 (Misc.)
Li, F., 247 (Hel.)
—— & Wu, S., 661 (Misc.)
Li, T. Y. & Thompson, H. G., 628 (Hel.)
Liddo, S., 197 (Dys.)
Lie, H. P., 537 (Lep.)
Lieurade, L., 19 (S.S.)
Lièvre, H., 250 (Hel.)
Lima, Q., 607 (Rab.)
Lindberg, K., (753) (Mal.)
Linders, F. J., with Svensson, 220 (Misc.)
Lindsay, J. W., (915) (Misc.)
Linetzkaja, A., with Jelin & Grossmann, 161 (Fev.)
Ling, L. C., with Yao, 726 (Mal.)
Ling, S. C., with Yao & Hsu, 619 *bis* (Hel.)
Linton, R. W., 768, (772) (Chl.)
—— & Mitra, B. N., 461 (Chl.)
—— & Seal, S. C., (772) (Chl.)
——, Shrivastava, D. L. & Mitra, B. N., (462) (Chl.)
——, Singh, H. & Seal, S. C., 772 (Chl.)
Lipatova, T., 454 (Pl.)
Lisova, A. I. & Eskin, V. A., 734 (Mal.)
Lister, S., 66 (Misc.)
Liu, K. B., (753) (Mal.)
Liu, L. S., (753) (Mal.)
Lloyd, L., with Boxhall & Happold, 222 (Misc.)
Lloyd, W. & Mahaffy, A. F., 289 (Y.F.)
Loewenstein, E., 550, 861 (Lep.)
Loewenthal, L. J. A., 182, 185 (Der.)
Logie, H. B., 463 (B.R.)
Lombardo, F., 576 (Fev.)
Lomholt, S. & Engelbreth-Holm, J., 866 (Lep.)
Long, J. D., 848 (Pl.)
—— & Mostajo, B., 448 (Pl.)
van Loon, J. P., (532) (Misc.)
López, C., with Steiner, 608 (Rab.)
Lopez-Neira, C., (279) (Hel.)
Lopez Neyra, C. R. & Suarez Peregrin, E., 224 (Misc.)
Lorando, N., 564 (Fev.)
Lossev, L., 256 (Hel.)
Lotsong, S., with Tchang, 567 (Fev.)
Loucks, H. H., 619 (Hel.)
Lounsberry, C. R., 381 (Sn.)
Lourie, E. M., 117, 415, 416 (Mal.)
——, Murgatroyd, F. & Yorke, W., 697 (S.S.)
Love, J., (147) (Mal.)
Low, G. C., 278 (Hel.)
—— & Cordiner, G. R. M., 672 (Misc.)
—— & Fairley, N. H., 45 (Sp.)
—— & Manson-Bahr, P. H., 274 (Hel.)
Lowe, J., 336, 550, (555) (Lep.), 424 (Mal.)
Lowenthal, H. F. & Roberts, R. A., 244 (Hel.)
Lutrot, M., 624 (Hel.)
Lupu, D., with Slatineanu, Balteanu, Sibi, Nitzulescu, Franche, Cantacuzino, Paraschivescu & Veit, 469 (Pel.)
Lwoff, A., 223 (Misc.)
Lynch, K. M., (198) (Am.)

M

Maasland, J. H., with Kouwenaar & Wolff, 521, (532 *bis*) (Misc.)
McAlpine, J. G., with Baker & Gill, 564 *bis* (Fev.)
MacCallan, A. F., 471, 896 (Oph.)
McCarrison, R., Sankaran, G. & Beer, W. A., 174 (Rab.)
McCay, F. H., (198) (Am.)
McClean, S. D. & Marsh, F., 194 (Dys.)
McClosky, A. J., 71 (Misc.)
McClure, R. B., 82 (K.A.)
McCoy, G. W. & Chesley, A. J., (198) (Am.)
McCoy, O. R., 645 (Hel.)
Macdonald, A. E. & McKenzie, K. G., 899 (Oph.)

McDonald, W. M., 733 (Mal.)
Macfarlane, R. G. & Barnett, B., 380 (Sn.)
——, with ——, 381 (Sn.)
McGuire, J. P., with Shortt, Brooks & Stephens, 610 (Rab.)
McIvor, B., with Herms & Bailey, 914 (Oph.)
Mackay, R., (147) (Mal.)
Mackehenie, D., 583 (Fev.)
McKendrick, A. G., 616 (Rab.)
McKenzie, K. G., with Macdonald, 899 (Oph.)
Mackerras, I. M., 672 (Misc.)
Mackie, F. P., 350 (S.S.), 821 (Bl.)
—— & Fairley, N. H., 46 (Sp.)
Mackie, T. T., 44 (Sp.), 513 (Misc.)
McKinley, E. B., 64 (Misc.), 535 (Lep.)
MacLeod, J. M. H., 493 (K.A.), 541 (Lep.)
McMahon, J. P., 910 (Misc.)
McMillan, J. S., 494 (H.S.)
McNabb, P. E. & Schwartz, S. C., 111 (Mal.)
Macnamara, C. V., 572 (Fev.)
McNeil, E., with Kofoid & Bonestell, 222 (Misc.)
McRobert, G. R., 72 (Misc.)
Madras, 247 (Hel.), 453 (Pl.)
Maegraith, B., 71 (Misc.)
de Magalhaes, O., (674) (Misc.)
——, with Moreira, 157 (Fev.)
Magasin de Parasitologie de l'Institut Zoologique de l'Académie des Sciences de l'URSS, 906 (Misc.)
Magath, T. B., (199) (Am.), 660 (Misc.)
Magidson, O. J., with Kritschewski, Halperin & Grigorowski, 419 (Mal.)
Mahaffy, A. F., with Beeuwkes, Burke & Paul, 282 (Y.F.)
——, with Lloyd, 289 (Y.F.)
Majewski, C., 472 (Oph.)
Majid, S. A., with Sinton, 816 (Mal.)
Majumdar, A. R., 464 (B.R.)
Malamos, B., 124, 125 *bis* (Mal.), 718 (S.S.)
——, with Denecke, 423 (Mal.)
—— & Nauck, E. G., 797 (Mal.)
——, with ——, 800 (Mal.)
Maldonado, A., (584) (Fev.)
Maldonado Sampedro, M., (147) (Mal.), 639 (Hel.)
Mallik, K. L. B., (655) (Hel.)
Malowitschko, E. & Pupenko, I. G., (199) (Am.)
Manai, A., 70 (Misc.)
Manako, K., (772) *bis* (Chl.)
Manalang, C., 865 (Lep.)
Manca, S., 414 (Mal.)
Manouélian, Y., 605, 618 (Rab.)
Manson, D., 111, 135, 414 (Mal.), 235 (Hel.)
Manson-Bahr, P., 407 (Mal.), (532), (915) (Misc.)
——, with Low, 274 (Hel.)
Manwell, R. D., 119, 796 (Mal.)
Maplestone, P. A., 642 (Hel.)
Marchal, G., Soulié, P. & Grigaut, A., (279) (Hel.)
Marchoux, E., 329 (Lep.)
—— & Chorine, V., 546 (Lep.)
Marin, R. A., with Levine, 627 (Hel.)
Marinesco, G. & Draganesco, S., 179, 617 (Rab.)
—— & Façon, E., 617 (Rab.)
Marini, C., with Villain & Dupoux, 805 (Mal.)
Marino, A. W. M., (199) (Am.)
Mariotti, E., with Ascione, 794 (Mal.)
Markianos, J., with Lépine, 546 (Lep.)
de Marqueissac, H., 695 (S.S.)
Marsh, F., with McClean, 194 (Dys.)
Martillotti, F., (655) (Hel.)
Martin & Arnaud, 631 (Hel.)
Martin, F., with Grayson & Clark, (532) (Misc.)
Martin, L. A., with Blanc, 566 (Fev.)
Martin, P. H., 138 (Mal.)
Martindale, W. E., with Barnes, Metcalfe & Lentz, 179 (Rab.)
Martínez-Báez, M., 649 (Hel.)
Martini & Zotta, 101 (Mal.)
Martini, E., 907 (Misc.)
Marty, M., 18 (S.S.)
Marzinovsky, E., 673 (Misc.)
Marzinowsky, E., (445) (Mal.)
Masayama, S., 571 (Fev.)
Masciotra, A. A., (147) (Mal.)
Mason, M., 78 (B.R.)
Massari, P., with Montel & Le-van-Phung, 55 (Y. & S.)
Massias, C., (7) (Bb.), 112, 113 *bis* (Mal.), (227), 524, 525, (915) (Misc.), 498 (C.Bu.)
——, Bourgin, P. & Nguyen-van-Tan, 420 (Mal.)
Masuzawa, T., with Ota & Sato, 871 (Lep.)
Mathew, R. Y., 905 (Misc.)
Mathieu, V., with Walker, 892 (Y. & S.)
Mathis, C., 284 (Y.F.), (782) (Am.),
——, Durieux, C. & Advier, M., 288 (Y.F.)
——, Laigret, J. & Durieux, C., 284 (Y.F.)
—— & Mathis, M., 287 (Y.F.)
Mathis, M., 292, (882) (Y.F.)
——, with Nicolau & Kopciowska, 293 (Y.F.)
Matsuda, S., 177, 609 (Rab.)
Matsumoto, K., with Suzuki & Sugio, 376 (Sn.)
Matsuoka, S., with Hayashi, Kato & Okamoto 169 (Fev.)
Matthes, H. C., 442 (Mal.)
Mauro, M., (147) (Mal.)
Maury, M., with Millous, 18 (S.S.)
Maxwell, J. L., 860 (Lep.)
Mayeozoko, S., 634 (Hel.)
Mayer, M., 226 (Misc.), 481 (K.A.)
Mazza, S., 37 *ter*, 38, (371), 717 (S.S.)
—— & Almaraz, P., 37 (S.S.)
—— & Guerrini, F. Z., 36 (S.S.)
—— & Jorg, M. E., (43) (S.S.)
—— & Miyara, J. S., 717 (S.S.)
——, ——, Basso, G. & Basso, R., 717 (S.S.)
—— & Romaña, C., (43) (S.S.)
Mazzolani, C., (915) (Misc.)
Measham, J. E. & Chowdhury, M. U., 804 (Mal.)
Mededeelingen van den Dienst der Volksgezondheit in Nederlandsch-Indië, (227) (Misc.)
Medulla, C., 561 (Fev.)
Megaw, J., 153 (Fev.)
Megaw, J. W. D., with Rogers, 151 (B.R.)
Méhes, J., (7) (Bb.)
—— & Peter, F., (7) (Bb.)
Mehta, D. R., 435, 808 (Mal.)
Meighan, S. S., 895 (Oph.)
—— & Peter, F., (7) (Bb.)

de Meillon, B., 133 (Mal.)
Meira, J. A., with Pessôa, 839 (B.R.)
Meleney, H. E., (199) (Am.)
—— & Crabtree, J. A., 107 (Mal.)
—— & Frye, W. W., 190, 779 (Am.)
—— & Harwood, P. D., 668 (Misc.)
Melikowa, T. A., with Bogojawlenski & Demidowa, 482 (K.A.)
Mellanby, K., 669 (Misc.)
de Mello, F., 784 (Mal.)
Memorskij, W., (894) (Y. & S.)
Mendioroz, J., (348) (Lep.)
Menon, T. B. & Annamalai, D. R., 273 (Hel.)
——, Krishnaswamy, T. K. & Annamalai, D. R., 789 (Mal.)
Mercier, H., with Sicé, 21, 349 (S.S.)
Merken, G., 724 (S.S.)
Merklen, P. & Israël, L., 492 (K.A.)
Mertens, W. K., with Hoffmann & Snijders, 171 (Fev.)
Mesnard, J. & Delbove, P., 157 (Fev.)
—— & Toumanoff, C., (753) (Mal.)
Metcalfe, A. N., with Barnes, Martindale & Lentz, 179 (Rab.)
Metelkin, A., 660 (Misc.)
Mettam, R. W. M., with Duke & Wallace, 33 (S.S.)
Meyer, F., (470) (Pel.)
Mezger, J., with Roubaud, 121 (Mal.), 449 (Pl.)
Miguelotte-Vianna, M., with Vellard, 380 (Sn.)
Mihăilescu, M. & Nicoloff, D., 490 (K.A.)
Milam, D. F., 167 *bis* (Fev.)
Milasch, G. P., 552 (Lep.)
Miller, D. K., with Rhoads, 48 (Sp.), 906 (Misc.)
Miller, H. M., Jr., 634 *bis* (Hel.)
—— & Gardiner, M. L., 255 (Hel.)
Miller, R., 45 (Sp.)
Millischer, P., 775 (Am.)
——, with Fillion, 658 (Misc.)
Millous, M. & Maury, M., 18 (S.S.)
Mills, S. R., 467 (Pel.)
Milne, J. C., 96 (Mal.)
Minamizaki, Y., 619 (Hel.)
Minatoya, T., 212 (Bl.)
Minec, with Grimes & Cluzet, 869 (Lep.)
Minerwin, S. M., Stupnitzki, P. N. & Tinker, J. S., 455 (Pl.)
Minett, F. C., 821 (Bl.)
Mingazzini, U., (147) (Mal.)
Mingelen, R., with Houwer, 898 (Oph.)
Missiroli, A., 304 (B.R.), 795, 807 (Mal.)
——, with Hackett, 809 *bis* (Mal.)
—— & Mosna, E., 794 (Mal.)
Mitchell, E. C. & Goltman, D. W., (753) (Mal.)
Mitra, B. N., 768 (Chl.)
——, with Linton, 461 (Chl.)
——, with —— & Shrivastava, (462) (Chl.)
Miyahara, H., with Morishita & Ishioka, 745 *bis* (Mal.)
Miyara, J. S., with Mazza, 717 (S.S.)
Miyara, S., with Mazza, Basso, G. & Basso, R., 717 (S.S.)
Miyazawa, M., with Nishibe, 162 (Fev.)
Moberg, E., (147) (Mal.)
Moir, K. T., 207 (Bl.)
Moiser, B., 545 (Lep.)
Moldawskaja-Kritschewskaja, W. D. with Sinelnikow, Gorchowa, Althausen & Gritzay, 792 (Mal.)
Molina, R. R., with Bachman & Gonzalez, 268 (Hel.)
Mollaret, P. & Stefanopoulo, G. J., 292 (Y.F.)
——, with ——, 284 (Y.F.)
——, with —— & Desnos, 290 (Y.F.)
Molloy, D. M., with Lamson & Brown, 635 (Hel.)
de Monbreun, W. A., 219 (Misc.)
Moncrieff, A., & Whitby, L. E. H., 72 *bis* (Misc.)
Monier, H. M., Guy, R. & Ros, M., 401 (Mal.)
——, with Saleun, 741 (Mal.)
Monnerot-Dumaine, (820) (Mal.)
Monnier, E., with Morin, Bader & Moreau, 727 (Mal.)
Monserrat, C., 547 (Lep.)
Montañés, P., 855 (Lep.)
—— & Negro, E., (92) (K.A.)
Monteiro, J. L., 159, 580 *bis*, 581, 582 (Fev.)
——, with Travassos, 581 (Fev.)
Montel, L., (279) (Hel.)
Montel, L. R., 344, 345 *bis*, 346 (Lep.)
Montel, M., 649 (Hel.)
Montel, M. L. R., 545, (555), 547 (Lep.)
——, Massari, P. & Le-van-Phung, 55 (Y. & S.)
—— & Nguyen-Ngoc-Nhuan, (555) (Lep.)
—— & Truong-van-Que, 346, 549 (Lep.)
Montel, R. & Truong-van-Que, (555) (Lep.)
Montestruc, E., 340 (Lep.), 892 (Y. & S.)
Montpellier, J. & Catanei, A., 182 (Der.)
Montschadsky, A., 908 (Misc.)
de Moor, C. E., with Lampe, 863 (Lep.)
Moore, M., 218 (Misc.)
Moorthy, V. N., 654 (Hel.)
Morales-Otero, P. & Pomales-Lebrón, A., 74 (Misc.)
Moreau, P., (445) (Mal.)
——, with Morin, Bader & Monnier, 727 (Mal.)
——, with Sicé, 547 (Lep.)
Moreira, J. A. & de Magalhães, O., 157 (Fev.)
Morgan, M. T., 585, (882), (Y.F.)
Morin, H. G. S., 430, (753) (Mal.)
——, Bader, H., Monnier, E. & Moreau, P., 727 (Mal.)
—— & Carton, P., (753), (820) (Mal.)
Morishita, K., (753) (Mal.)
——, Miyahara, H. & Ishioka, H., 745 *bis* (Mal.)
Morison, J., 764 (Chl.)
——, Rice, E. M. & Haythornthwaite, R. A., 460 (Chl.)
Moroder, J., (43) (S.S.)
Morris, K. R. S., 40 (S.S.)
Moshkovsky, S. & Burova, L., 409 (Mal.)
—— & Poliakova, A., 409 (Mal.)
Mosna, E., 432 (Mal.)
—— with Missiroli, 794 (Mal.)
Mostajo, B., with Long, 448 (Pl.)
Mostert, H. v. R., 859 (Lep.)
Mouchet, R., van Hoof, L., Duren, A., Fornara, L., Clarebout, G., Henry, E. & Henrard, C., 280 (Y.F.)

Moursund, W. H., with Kemp & Wright, 296 (R.F.)
Mourzinn, A. N. & Souchkowa, E. G., 473 (Oph.)
Moutoussis, K., 337 (Lep.)
Mu, J., 636 (Hel.)
Mueller, J. F., (655) (Hel.)
Muench, H., with Boyd & Stratman-Thomas, 405 (Mal.)
——, with Howard & Earle, 739 (Mal.)
Mühlens, P., 109, 406, (753) (Mal.), 515 (Misc.), (782) (Am.)
Muir, E., 341, 542 (Lep.)
—— & Chatterji, K. R., 539, 543 (Lep.)
Mukerji, S., with Smith & Krishnan, 88 (K.A.)
Mukherjee, S. N., with Chopra & Sen, 789 (Mal.)
Mulligan, H. W., 797 (Mal.)
——, with Sinton, 122 (Mal.)
Mulrennan, J. A., with Boyd, 135 (Mal.)
——, with —— & Cain, 806 (Mal.)
Muñoz Ochoa, M., with Strong, Sandground & Bequaert, 300 (B.R.)
Murashima, T., 195 (Dys.)
Muratowa, A. P., 173 (Rab.)
Murgatroyd, F., with Lourie & Yorke, 697 (S.S.)
——, Russell, H. & Yorke, W., 26 (S.S.)
——, with Yorke, 518 (Misc.)
Murphy, R. A., 141, 412 (Mal.)
Murray, A. J., 826 (Bl.)

N

Nabokich, P., with Beklemischew, Schipizina & Polowodowa, 907 (Misc.)
Nadler, J. E., Green, H., & Rosenbaum, A., 216 (Misc.)
Nagayoshi, Y., with Kawai & Koo, 187 (Am.)
Nägelsbach, E., 207 (Bl.), (445) (Mal.) (894) (Y. & S.)
Nakamura, K. & Kobashi, S., 339 (Lep.)
Nakamura, T., 378 (Sn.)
Narayana Rao, Y. S., 764 (Chl.)
Narihara, N., 254 *bis* (Hel.)
Nash, T. A. M., 39, 723 *bis* (S.S.)
Nath, M. C., with Ghosh, 422 (Mal.)
Nattan-Larrier, L., 43 (S.S.)
—— & Grimard, L., 485 (K.A.)
—— & Grimard-Richard, L., 85 *ter*, 87, 484 (K.A.)
——, —— & Nouguès, S., 85 (K.A.)
——, Nouguès, S. & Grimard-Richard, L., 85 (K.A.)
Nauck, E. G., 116 (Mal.)
——, with Hegler, 77 (B.R.)
—— & Malamos, B., 800 (Mal.)
——, with ——, 797 (Mal.)
Naumann, H. E., 200 *bis* (Bl.)
Nayar, K. K., with Wright & Nayudu, 476 (Oph.)
Nayudu, T. V., with Wright & Nayar, 476 (Oph.)
Nechkovitch, M., 381 (Sn.)
Negro, E., with Montañés, (92) (K.A.)
Negroni, P., 185 (Der.)
Neitz, W. O. & Thomas, A. D., 616 (Rab.)
Nelson, E. C., 225 (Misc.)
d'Netto, S. G., with Vickers & West, 139 (Mal.)
Neuber, E., 648, 649 (Hel.)
Neumann, H., with Schilling, Schreck & Kunert, 43 *bis* (S.S.)
Newman, C. D. & Chalam, B. S., 417 (Mal.)
Ngo-Quang-Ly, with Dorolle, 545, (554) (Lep.)
——, with —— & Tran-Van-Tam, 346 (Lep.)
Nguyen-van-Lien, with Guillerm & Banos, 342 (Lep.)
Nguyen-Ngoc-Nhuan, with Montel, 555 (Lep.)
Nguyen-van-Tan, with Massias & Bourgin, 420 (Mal.)
Nicholls, L., 763 (Chl.)
Nicol, W. D., with James & Shute, 737 (Mal.)
Nicolas, C., 546 (Lep.)
Nicolau, S. & Kopciowska, L., 173, 605 (Rab.)
——, —— & Mathis, M., 293 (Y.F.)
——, with Slatineanu & Balmus, 741 (Mal.)
Nicolle, C., 284 (Y.F.), 560 (Fev.), 589 (Y.F.)
—— & Giroud, P., 557, 558 *bis*, 559, (582) (Fev.)
—— & Laigret, J., 880 (Y.F.)
—— & Sparrow, H., 158, 560, 578 (Fev.)
Nicoloff, D., with Mihăilescu, 490 (K.A.)
Nieschulz, O. & du Toit, R. M., 663 (Misc.)
Nigg, C., 569 (Fev.)
Nijkamp, J. A. & Swellengrebel, N.H., 136 (Mal.)
Ninni, C. & Tramontano, V., 486 (K.A.)
Niño, F. L., 184 (Der.), (227) (Misc.), 269 (Hel.)
—— & Triaca, J. A., (227), (674) (Misc.)
Nishibe, M. & Miyazawa, M., 162 (Fev.)
van Nitsen, R., 100, 408, 742 (Mal.), 248 (Hel.)
—— & Duwez, J., 306 (B.R.)
Nittis, S., (873) (Lep.)
Nitzulescu, J., with Slatineau, Balteanu, Sibi, Franche, Catacuzino, Paraschivescu, Veit & Lupu, 469 (Pel.)
Nolasco, J. O., 343, 344, 535 (Lep.)
Noosten, H. H., Kirschner, L. & Vos, J. J. T., 73 (Misc.)
Noronha, A. J., 254 (Hel.)
Noshokati, H., with Azmy & Gaafar, 527 *bis* (Misc.)
Nossina, V., 776 (Am.)
Nouguès, S., with Nattan-Larrier & Grimard-Richard, 85 (K.A.)
Noury, M., with Blanc, Baltazard, Bruneau & Barneoud, 163 (Fev.)
Novák, E., with von Janscó, 596 (R.F.)
Novet, D., Benoit, G. & Atmann, R., (820) (Mal.)
Nursing, D., Rao, B. A. & Sweet, W. C., 399 (Mal.)
Nykamp, J. A., with Swellengrebel, 136 (Mal.)

O

Occhino, A. & Kernkamp, Y., 56 (Y. & S.)
O'Connor, F. W., (532) (Misc.)
O'Connor, M. P., 577 (Fev.)

d'Oelsnitz, Bonnet, G. & Raybaut, A., 493 (K.A.)
——, Galavielle, R. & Raybaut, A., (493) (K.A.)
—— & Ronchèse, A. D., 86 (K.A.)
Oesterlin, M., 250 *bis* (Hel.)
—— & Krainick, H., 236 (Hel.)
Office International d'Hygiène Publique, Paris, 459 (Chl.)
O'Flynn, J. A., (470) (Pel.)
Ogiuti, K., with Tani, 57 (Y. & S.)
O'Hara, J. A., (147) (Mal.)
Ohira, T., (655) (Hel.)
Ohmori, N., 670, 913 (Misc.)
Ohtawara, T., 864 (Lep.)
Ohtsuka, I., with Ozaki, 563 (Fev.)
Okamoto, N., with Hayashi, Matsuoka & Kato, 169 (Fev.)
Okamoto, Y., with Kasahara & Yoshida, 566 (Fev.)
Okounevski, J. & Khakhaieva, V., 662 (Misc.)
Olavarria, J. & Hill, R. B., 815 (Mal.)
——, with ——, (147) *bis* (Mal.)
——, with —— & Rivera, 814 (Mal.)
de Oliviera Castro, G. M. & Bier, O., (583) (Fev.)
Oliver, J., with Bachman, 268 (Hel.)
Oliver, W. W., (199) (Am.)
Orenstein, A. J., 235 (Hel.)
Ota, M. & Ishibashi, T., 551 (Lep.)
—— & Sato, S., 338 (Lep.)
——, ——, Sato, S. & Ishibashi, T., (555) (Lep.)
——, —— & Masuzawa, T., 871 (Lep.)
Oteiza y Setién, A. & Tiant y del Río, F. R., 855 (Lep.)
Othaz, E. L., 185 (Der.)
Otto, I. H., & Tschan Tsching Ji, 630 (Hel.)
Otto, J. H., (655) (Hel.)
Otto, R., 153 (Fev.)
Owen, W. B., Honess, R. F. & Simon, J. R., 188 (Am.)
Oxenius, K., (655) (Hel.)
Ozaki, Y. & Ohtsuka, I., 563 (Fev.)

P

Packchanian, A., 35, 711 (S.S.)
Padovani, S., 897 (Oph.)
Paget, H., Trevan, J. W. & Attwood, A. M. P., 343 (Lep.)
Pagonis, A., with Caminopetros, Contos & Pheloukis, 575 (Fev.)
Paic, M., with Levaditi & Vaisman, 298 (R.F.)
Palais, M., 253 (Hel.)
Palawandow, H., Serebrennaja, A. I. & Pugatsch, E. M., 609 (Rab.)
Paldrock, A., 347, 871 (Lep.)
—— & Pooman, A., 340 (Lep.)
Palit, A. N., (915) (Misc.)
Pallary, P., 227, 243 (Hel.)
Palmer, F. J., 73, (227) (Misc.)
Pampana, E. J., 410 (Mal.)
P'an, C., 476 (Oph.)
Panayotatou, A., (583) (Fev.)
Pandalai, N. G., 599 (R.B.F.)
Pandit, C. G., 841 (Pl.)
Paolo, R., (445) (Mal.)
Papazian, R., with Vasilescu, (782) (Am.)
Paradiso, F. & Fiorentino, A., 534 (B.R.)
Paras, A., with Lagrosa, Alonso & Tiong, 547 (Lep.)
Paraschivescu, Z., with Slatineanu, Balteanu, Sibi, Nitzulescu, Franche, Cantacuzino, Veit & Lupu, 469 (Pel.)
Pardina, J. M., 230 (Hel.), 904 (Misc.)
Paretskaya, M., with Yatsenko & Kipritch, 666 (Misc.)
Paris Eguilaz, H., (43) (S.S.)
Parker, R. R., 517 (Misc.)
Parmakson, P., 551 (Lep.)
Parrot, L., 90, 486 *bis* (K.A.)
—— & Catanei, A., 739 (Mal.)
—— & Donatien, A., 484 (K.A.)
——, with Foley, 397 (Mal.)
Parsa, S., 99 (Mal.)
Parsons, H. T., with Lease, (532) (Misc.)
Pârvulescu, Constantinesco, N. & Boeriu, V., 750 (Mal.)
Pascal, J. M., 62 (Misc.)
Pasco, A. M., with Tubangui & Basaca, 234, 635 (Hel.)
Pasteur, F., with Phisalix, 381 (Sn.)
Paterson, A. R., 306 (B.R.)
Paterson, J. C., 208 (Bl.)
Patiño Mayer, C. & García Robin, A., (782) (Am.)
Paul, J. H., with Beeuwkes, Mahaffy & Burke, 282 (Y.F.)
de Paula e Silva, G. S., (675) (Misc.)
Paulicevich, with Girard, 600 (R.B.F.)
Paulino, P., with Albert, 636 (Hel.)
Pavloff, P., 193, 780 (Am.)
Pavlovsky, E. N. & Stein, A. K., 672 (Misc.)
——, —— & Bytschkov, W. A., 908 (Misc.)
Payne, G. C., with Rhoads, Castle & Lawson, 263 *bis* (Hel.)
Payne, W., with Spies & Chinn, 468 (Pel.)
Peaston, H., with Gordon & Davey, 237 (Hel.)
Peat, A. A., with Kumm & Turner, 886 (Y. & S.)
Peckolt, W. & Prado, A., 145 (Mal.), 657 (Misc.)
Pecori, G. & Escalar, G., 404 (Mal.)
Peel, with Schwetz, 126 (Mal.)
Peiping Union Medical College, 676 (B.R.)
Peirier, J. C., (532) (Misc.)
Peli, G. & Benignetti, D., 92 (K.A.)
Pellé, A. & Tannou, (199) (Am.)
Peltier, M., with Choucroun, 554 (Lep.)
—— & Riou, M., 890 (Y. & S.)
Peña, V., (199) (Am.)
Peña Chavarría, A. & Rotter, W., 889 (Y. & S.)
Penna, H. A., 481 (K.A)
People's Commissariat for Public Health S.S.R.A., 67 (Misc.)
Pepeu, F., 382, 383 (Sn.)
Peratoner, U., (214) (Bl.)
Pereira, O. L., 347 (Lep.)
Pereira, P. C. R., 856 (Lep.)
Perla, D., 42, 362 (S.S.)
Perrot, E., 342 (Lep.)
Pervès, (915) (Misc.)
Peryassú, A., 448 (Pl.)

Peschkowsky, G. W., 336 (Lep.)
Pessôa, S. B. & Meira, J. A., 839 (B.R.)
Péter, F., with Méhes, (7) (Bb.)
Petersen, W. F., with Hoverson, 217 (Misc.)
Petitpierre, M., 382 (Sn.)
Petrishcheva, P. A., 802 (Mal.), 907 (Misc.)
Peycelon, A., with Lassablière, 20, 42 (S.S.)
Pham, H. C., 766 (Chl.)
Pheloukis, T., with Caminopetros, Contos & Pagonis, 575 (Fev.)
Phisalix & Houdemer, E., 372 (Sn.)
Phisalix, M. & Pasteur, F., 381 (Sn.)
Pi, H. T., 474 *bis* (Oph.)
Piazza, G., 534 (B.R.)
Piekarski, G., (675) (Misc.)
Pierce, C. C., 280 (Y.F.)
Pigulewsky, S. W., 217 (Misc.)
Pijper, A., 168 (Fev.)
—— & Dau, H., 154, 561 (Fev.)
Pikul, J., Serguiev, P. & Tibourskaya, N., 434 (Mal.)
Pinelli, L., 750 (Mal.)
Pines, A. I., with Kritschewski, (752) (Mal.)
Piney, A., 484 (K.A.)
Pinto, G. de S., (147) (Mal.)
Pires, R. E., 440 (Mal.)
Pirie, J. H. H. & Grasset, E., 852 (Pl.)
Pirot, with Le Moult, 231 *bis* (Hel.)
Pischel, D. K., 474 (Oph.)
Pittaluga, G., 79 (B.R.), 751 (Mal.)
Pitti-Ferrandi, F. & Sautet, J., 800 (Mal.)
Plantilla, F. C., with Rodriguez, (873) (Lep.)
Podoljan, W. J., with Guzewitsch, (915) (Misc.)
Podyapolskaya, V. & Gnedina, M., 232 (Hel.)
Poggi, I., 657 (Misc.)
Poindexter, H. A., 362 (S.S.)
Poisson, H., 632 (Hel.)
Poliakova, A., with Moshkovsky, 409 (Mal.)
Pollitzer, R., 761, (772) (Chl.)
Polowodowa, W., with Beklemischew, Schipizina & Polowodowa, 907 (Misc.)
Pomales-Lebrón, A., with Morales-Otero, 74 (Misc.)
Pons, R., 851 (Pl.)
Poole, L. T. & Sachs, A., 172 (Fev.)
——, with Shortt & Stephens, 171 (Fev.)
Pooman, A., 551, 866, (873) (Lep.)
——, with Paldrock, 340 (Lep.)
Portelly, J., (227) (Misc.)
Postmus, S., with Snijders & Schüffner, (295) (Y.F.)
Pottier, R., with Van den Branden, 355 (S.S.)
Poumailloux, M., with Benard & Brincourt, 492 (K.A.)
Poursines, Y., with Giraud, 84 (K.A.)
Powell, B. J., Jr., 471 (Oph.)
Prado, A., (227) (Misc.)
—— & Godinho, R., (753) (Mal.)
——, with Peckolt, 145 (Mal.), 657 (Misc.)
Pratt-Johnson, J., 383 (Sn.)
Preston, P. G., 652 (Hel.)
Price, A. G., (533) (Misc.)
Pridie, E. D., 280, 874 (Y.F.)
Prieur, M., with Launoy, 696 (S.S.)
Proca, G., Bobes, S. & Jonnesco, D., 180, 618 (Rab.)
Proceedings of the Royal Society of Medicine, 821 (Bl.)
Prudhomme, R., 553 *bis* (Lep.)
——, with Chorine & Koechlin, 130 (Mal.)
Prudhomme, R. O., 864, 871 (Lep.)
Prümm, A., 634 (Hel.)
Pryn, R. H. C., 498 (C.Bu.)
Public Health Reports, 446 (Pl.), 589, 590 (Y.F.), (873) (Lep.)
Puente, J. & Fiol, H., (555) (Lep.)
Puente, J. J., with Sussini & Roberto Paso, 861 (Lep.)
Pugatsche, E. M., with Palawandow & Serebrennaja, 609 (Rab.)
Puntoni, V., 808 *bis* (Mal.)
Pupenko, I. G., with Malowitschko, (199) (Am.)
Purcell, F. M., 7 (Bb.), 52 (Y. & S.)
Pusa, (228) (Misc.)
Putnam, P., & Shannon, R. C., 593 (Y.F.)

Q

Quarterly Bulletin of the Health Organization, League of Nations, 410 (Mal.)

R

Rabello, Jr., 90 (K.A.)
Radhakrishna Rao, M. V., with Tirumurti, 741 (Mal.)
Raffaele, G., 121 (Mal.)
Raghavan, P., with Vengsarkar & Godbole, (228) (Misc.)
Ragiot, C. & Delbove, P., 157, 562 (Fev.)
——, —— & Tran-van-Tu, 157 (Fev.)
—— & Robin, L. A., 112 *bis* (Mal.)
Raimondi, S. & Feijoó, E. J. C., 36 (S.S.)
Raingeard, 19 (S.S.)
Raja, K. C. K. E., 460 (Chl.)
Rajam, R. V., 497 (C. Bu.)
Ramijean, with Souchard, 342 (Lep.)
Ramos, J., (753) (Mal.)
Ramos, J. M., with de Leon, & de Jesus, (532) (Misc.)
Ramos Baez, P., with Hoffmann, (555) (Lep.)
Ramsay, G. W. S. C., 654 (Hel.)
Ranjeva, J., with Seyberlich, 853 (Pl.)
Rao, B. A., with Nursing & Sweet, 399 (Mal.)
——, with Sweet, 94 (Mal.)
Rao, M. A. N., 629 (Hel.)
Raskin, A., 694 (S.S.)
——, with Tareev, Bolotina, Gontaeva & Epstein, 111 (Mal.)
Ratcliffe, H. L., 221 (Misc.)
Rathery, F., Dérot, M. & Conte, M., (493) (K.A.)
Ratnagiriswaran, A. N., Sehra, K. B. & Venkataraman, K., 622 (Hel.)
——, with Venkatachalam, 378 (Sn.)
Ray, P. N., 271 (Hel.)
Raybaud, A., 168 (Fev.)
——, with d'Oelsnitz & Bonnet, 493 (K.A.)
——, with —— & Galavielle, (493) (K.A.)
Raymond-Hamet, 444 (Mal.)
Raynal, J., 460 (Chl.)
Recio, A., 283 (Y.F.)
Redaelli, P., 534 (B.R.)
—— & Ciferri, R., 181 (Der.), 219, 905 (Misc.)

Reed, A. C., (199) *bis* (Am.)
——, with Anderson, (197) *bis* (Am.)
Reed, E. U., 509 (Misc.)
Reichel, J. & Schneider, J. E., 178 *bis* (Rab.)
Reichenow, E., 34, 718 (S.S.)
Reichs-Gesundheitsblatt, 178 (Rab.)
Reid, P. E., Anderson, M. X., Stubblefield, H. I. & Ivy, A. C., 194 (Dys.)
Reiner, L. & Smythe, C. V., 42 (S.S.)
Reiss, F., 535, (555) (Lep.)
Remlinger, P., 617 (Rab.)
—— & Bailly, J., 174, 175, 177, 605, 606, 618 (Rab.)
Renucci, N., with Huard, 524 (Misc.)
Reports National Quarantine Service, (772) (Chl.)
Rev. Hort. Agric. Afr. N. Algiers, 662 (Misc.)
Rhea, T., with Wayson, 541 (Lep.)
Rhoads, C. P. & Castle, W. B., 46 (Sp.)
——, ——, Payne, G. C. & Lawson, H. A., 263 *bis* (Hel.)
——, with Crane-Lillie, 469 (Pel.)
—— & Miller, D. K., 48 (Sp.), 906 (Misc.)
Rhodes, W. F., 561 (Fev.)
Ribeiro, L., (555) *bis*, 862 (Lep.)
Ribère, with Lemaire, 632 *bis* (Hel.)
——, with Thiodet, 791 (Mal.)
Rice, E. M., with Morison & Haythornthwaite, 460 (Chl.)
Rice, J. B. & Barber, M. A., 807 (Mal.)
Richardson, F. L., 221 (Misc.)
Riding, D., 556 (Fev.)
Rieder, W., 48 (Sp.)
Riesel, M., with Uriarte, Calcagno & Anchezar, 447, (456) (Pl.)
Riesman, D. & Davidson, H. S., 4 (Bb.)
Riley, G. E., (147) (Mal.)
——, Faust, E. C. & Griffitts, T. H. D., 106 (Mal.)
Riley, W. A., 255 (Hel.)
Riou, M., with Blondin, 210 (Bl.)
——, Gourry, N. & Hussenet, S., 112 (Mal.)
——, with Peltier, 890 (Y. & S.)
Risquez, J. R., 38 (S.S.)
Rivera, J. & Hill, R. B., 814 (Mal.)
——, with —— & Olavarria, 814 (Mal.)
Roberto Paso, J., with Sussini & Puente, 861 (Lep.)
Roberts, F. W., 89 (K.A.)
Roberts, J. I., 574 (Fev.)
Roberts, R. A., with Lowenthal, 244 (Hel.)
Robertson, D. S., with Chang, (198) (Am.)
Robertson, M., 223 (Misc.)
Robertson, R. C. & Hu, S. M. K., 99 (Mal.)
Robic, J., with Girard, (456) (Pl.)
Robin, L. A., 142 *bis*, 400, (753) (Mal.)
——, with Ragiot, 112 *bis* (Mal.)
Robin, M., 142 (Mal.)
Rockefeller Foundation, 78 (B.R.)
Rodenwaldt, E., 270, 271 (Hel.)
Rodhain, J. & Brutsaert, P., 716 (S.S.)
Rodrigues de Albuquerque, A. F., 552 (Lep.)
Rodriguez, J. & Plantilla, F. C., (873) (Lep.)
Rogers, J. M., with Bercovitz, 253 (Hel.)
Rogers, L. & Megaw, J. W. D., 151 (B.R.)
Romaña, C., (371), 717, 720 (S.S.)
——, with Mazza, (43) (S.S.)
Romanowa, K., with Roskin, 118 (Mal.)
Romiti, C., 647 (Hel.)
Ronchèse, A. D., with d'Oelsnitz, 86 (K.A.)
Ronconi, L., 92 (K.A.)
Ronse, M., 160, 161, 557 (Fev.)
—— & Bruynoghe, G., 568 (Fev.)
van Rooyen, C. E., with Greig & Hendry, 129 *ter*, 131 (Mal.)
Roques, H., 896 (Oph.)
Ros, M., with Monier & Guy, 401 (Mal.)
Rose, G., with Chen, 655 (Hel.)
—— & Koh, T. M., (656) (Hel.)
Rosenbaum, A., with Nadler & Green, 216 (Misc.)
Rosenholz, H. P. & Scherbina, L. I., 597 (R.F.)
Roskin, G. & Romanowa, K., 118 (Mal.)
Ross, H., with Black, 552 (Lep.)
Roth, H., 645 (Hel.)
Rotter, W. & Chavarría, A. P., 181 (Der.), 489 (K.A.)
——, with Peña Chavarria, 889 (Y. & S.)
Roubaud, E., 442, 814 (Mal.)
—— & Mezger, J., 121 (Mal.), 449 (Pl.)
Roukhadze, N. P., (753) (Mal.)
Roule, S., with Sicault, 819 (Mal.)
Roussel, J. N., 870 (Lep.)
Roy, A. C., with Chopra & Gupta, 412 (Mal.)
——, with —— & Ganguli, 787 (Mal.)
Roy, D. N., (675) (Misc.)
Royal College of Physicians of Edinburgh, (915) (Misc.)
Rozeboom, L. E., 134 (Mal.), 594 (Y.F.)
——, with Shah & Del Rosario, 425 (Mal.)
Rubino, M. C., 340 (Lep.)
Rubinstein, P. L., with Kritschewski, 793 (Mal.)
Rudneff, G. P., 849 (Pl.)
Ruge, H., 408 (Mal.)
Rugina, I., with Slatineanu, Ciuca, Balteanu, Alexa, E., Alexa, I. & Francke, 411 (Mal.)
Ruibinskiĭ, S. V. & Levit, M. S., 819 (Mal.)
Ruiz, P. M., 83 (K.A.)
Russell, A. J. H., 761 *bis* (Chl.), 841 (Pl.)
Russell, F. F., 513 (Misc.)
Russell, H., with Murgatroyd & Yorke, 26 (S.S.)
Russell, P. F., 97 *bis*, 401, 402 *bis*, 432, 435, 726 (Mal.), (675) (Misc.)
—— & Baisas, F., (753), 803 (Mal.)
—— & Eaton, L. S., 144 (Mal.)
—— & Santiago, D., 440 (Mal.)
Rybinsky, S., (147) (Mal.)
Rylovnikova, T., with Joukov & Krassikova, 114 (Mal.)
Ryrie, G. A., 346, (555) (Lep.)

S

Sabri, I. A., (782) (Am.)
Sachs, A., 296 (R.F.), 572 (Fev.)
——, with Poole, 172 (Fev.)
Sainte-Marie, F., 492 (K.A.)
Sainton, J., with Brumpt & Duvoir, (279) (Hel.)
Saito, M., 627 (Hel.)
Sáiz Moreno, L., 616 (Rab.)
Salah, M., 530 (Misc.)
—— & Hassan, A., 248 (Hel.)
——, with ——, 621 (Hel.)
——, with Khalil, 247 (Hel.)

Salem, H. H., 911 (Misc.)
Saleun, G. & Monier, H. M., 741 (Mal.)
Sánchez, J. A., (148) (Mal.)
Sanderson, I., with Buchanan, 519 (Misc.)
Sandground, J. H., with Strong, Bequaert & Muñoz Ochoa, 300 (B.R.)
Sanguinetti, L. V., with Udaondo & Zunino, 179 (Rab.)
Sankaran, G. & Beer, W. A., 607 (Rab.)
——, Iyengar, K. R. K. & Beer, W. A., 174 (Rab.)
—— with McCarrison & Beer, 174 (Rab.)
Sankaran, O. K., with Large, 195 (Dys.)
Santiago, D., with Russell, 440 (Mal.)
Santra, I., 540 *bis* (Lep.)
Sanyal, S., 895 (Oph.)
Sardjito & Sitanala, J. B., 337 (Lep.)
Sarnelli, T., 91 (K.A.), (228) (Misc.)
Sassuchin, D. N., 220 (Misc.)
Sato, S., with Ota, 338 (Lep.)
——, with —— & Ishibashi, (555) (Lep.)
——, with —— & Masuzawa, 871 (Lep.)
Satyanarayana, K., (148), 818 (Mal.)
Saunders, G. M., 885, 887 (Y. & S.)
—— & Turner, T. B., 794 (Mal.)
——, with ——, 883 (Y. & S.)
——, with —— & Johnston, 50 (Y. & S.)
Saunders, P. T., 247 (Hel.)
Sautet, J., (148), 751 (Mal.)
—— & Cordoliani, S., 406 (Mal.)
——, with Galliard, 403, (445) (Mal.)
——, with Pitti-Ferrandi, 800 (Mal.)
Savino, E., 447 *bis* (Pl.)
Savitska, H. P., with Krontowsky, Jazimirska-Krontowska & Soliterman, 569 (Fev.)
Savoor, S. R., with Lewthwaite, 577 (Fev.)
—— & Velasco, R., 159 (Fev.)
Scaduto, P., (656) (Hel.)
Scharff, J. W., 726 (Mal.)
Scharles, F. H. & Seastone, C. V., 906 (Misc.)
Schembra, F. W., 740 (Mal.)
Scherbina, L. I., with Rosenholz, 597 (R.F.)
Schilling, C., 714 *bis*, (724) (S.S.), 874 (Y.F.)
——, with Schreck, H., Neumann, H. & Kunert, H., 43 *bis* (S.S.)
Schipizina, N., with Beklemischew, Polowodowa & Nabokich, 907 (Misc.)
Schlesinger, W., 406 (Mal.)
Schlossberger, H. (873) (Lep.)
—— & Schüffner, R., 704 (S.S.)
Schneider, J. E., with Reichel, 178 *bis* (Rab.)
Schoen, R., with Levaditi, C. & Levaditi, J., 173 (Rab.)
Schofield, R. O., 494 (H.S.)
Scholer, H., 598 (R.F.)
Scholtens, R. T., 771, 772 (Chl.)
Schönhöfer, F., with Kikuth, (47), 420, (752) (Mal.)
Schoute, D., (555) (Lep.)
Schoute, E., with de Buck & Swellengrebel, 137 (Mal.)
Schreck, H., with Schilling, Neumann & Kunert, 43 *bis* (S.S.)
von Schuckmann, W., (915) (Misc.)
Schüffner, R., with Schlossberger, 704 (S.S.)
Schüffner, W., with Snijders & Postmus, (295) (Y.F.)
Schüffner, W. A. P., with Dhont & Snijders, 288 (Y.F.)
Schujman, S., with Fernandez, 869 (Lep.)
Schulemann, W., 786 (Mal.)
Schultz, R. & Ivanitski, S., 646 (Hel.)
Schwartz, B. & Alicata, J. E., 265 (Hel.)
Schwartz, J. L., (533) (Misc.)
Schwartz, S. C., with McNabb, 111 (Mal.)
Schwetz, J., 42 (S.S.), 125, (445) (Mal.), 226, 668 (Misc.), 695 (S.S.)
—— & Baumann, H., 115 (Mal.)
—— & Peel, 126 (Mal.)
Scorgie, N. J., 821 (Bl.)
Scorrer, E. H., (853) (Pl.)
Scott, A. V., with Fan, 483 (K.A.)
Scott, H. H., 150 (B.R.)
Scott, L. C., with Faust & Swartzwelder, 777 (Am.)
Seal, S. C., 768 (Chl.)
——, with Linton, (772) (Chl.)
——, with —— & Singh, 772 (Chl.)
Seastone, C. V., with Scharles, 906 (Misc.)
Sebrell, W. H., with Badger, 863 (Lep.)
Sédan, J., 897 (Oph.)
——, with Joyeux & Esmenard, 899 (Oph.)
Segerdahl, E., (228) (Misc.)
Seguy, E., (228) (Misc.)
Sehra, K. B., with Ratnagiriswaran & Venkataraman, 622 (Hel.)
Sei, M. T., 481 (K.A.)
Sellards, A. W., 591, 592 (Y.F.)
Selwyn-Clarke, P. S., 682 (S.S.)
Sen, B., with Chopra, 111 (Mal.)
——, with —— & Ganguly, 113 (Mal.)
——, with —— & Mukherjee, 789 (Mal.)
Sen, P., 803 (Mal.)
Sen, S., with Chopra, (198) (Am.)
de Sena, M., (555) (Lep.)
Senkewitsch, M. A., with Tinker, 908 (Misc.)
Serebrennaja, A. I., with Palawandow & Pugatsch, 609 (Rab.)
Serefettin, O., 562 (Fev.), (753) (Mal.)
Sergent, Edm., Sergent, Et. & Catanei, A., 120 (Mal.)
Sergent, Et., 120, 812 (Mal.)
——, with Sergent, Edm. & Catanei, 120 (Mal.)
—— & Trensz, F., 812 (Mal.)
Sergiev, P. G., 818 (Mal.)
Serguiev, P., with Pikul & Tibourskaya, 434 (Mal.)
Seyberlich, A. & Ranjeva, J., (853) (Pl.)
Sézary, A., Lévy, G. & Bolgert, M., 342 (Lep.)
Sfameni, M., 265 (Hel.)
Shafy Moh, A., 621 (Hel.)
Shah, K. S., 118 (Mal.)
——, Rozeboom, L. E. & Del Rosario, F., 425 (Mal.)
Shalom, E. S., 472 (Oph.)
Shannon, R. C., 440 (Mal.)
—— & Putnam, P., 593 (Y.F.)
Sharp, L., 331 (Lep.)
Shattuck, G. C., (782) (Am.)
Sherrard, G. C., with Trimble, 848 (Pl.)
Shin, H., 5 (Bb.)
Shipton, E. A. & Vickery, D., (753) (Mal.)
Shortt, H. E. & Brooks, A. G., 607 (Rab.)
——, McGuire, J. P., Brooks, A. G. & Stephens, E. D., 610 (Rab.)

Shortt, H. E., Poole, L. T. & Stephens, E. D., 171 (Fev.)
——, with Sinton, 491 (K.A.)
Showers, E. M., with Hinshaw, 188 (Am.)
Shrewsbury, J. F. D., 530 (Misc.)
Shrivastava, D. L., 768 (Chl.)
——, with Sinton & Mitra, (462) (Chl.)
Shute, P. G., with James & Nicol, 737 (Mal.)
Sibi, M., with Slatineanu, Balteanu, Nitzulescu, Franche, Cantacuzino, Paraschivescu, Veit & Lupu, 469 (Pel.)
——, with ——, Francke, M., Veit, E., Lupu, E. & Paraschivescu, Z., 747 (Mal.)
Sicault, G., 113 (Mal.)
—— & Roule, S., 819 (Mal.)
Sicé, A., with Bertrand & Bablet, 349 (S.S.)
—— & Mercier, H., 21, 349 (S.S.)
—— & Moreau, P., 547 (Lep.)
Sievers, O., 633 (Hel.)
Silberschmidt, W., 696 (S.S.)
Sillevaerts, C., (853) (Pl.)
de Silva, S., 407, 732 (Mal.)
Silverman, D. N., (199) *bis* (Am.)
Silvers, I. L., with Epstein, 158 (Fev.)
Silverthorne, N. & Brown, A., 665 (Misc.)
Silvestrini, R., 792 (Mal.)
Simeons, A. T. W., with Blaze, 746 (Mal.)
Simin, N. A., 904 (Misc.)
Simon, J. R., with Owen & Honess, 188 (Am.)
Simon, S. K. (199), (782) (Am.)
Sincke, G. E., 489 (K.A.), 658 (Misc.)
Sinelnikow, S. I., Moldawskaja-Kritschewskaja, W. D., Gorchowa, E. L., Althausen, D. S. & Gritzay, A. A., 792 (Mal.)
Singer, E., 596 (R.F.)
—— & Fischl, V., 355, 703 (S.S.)
——, with ——, 355, 701, 708 (S.S.)
——, Kotrba, J. & Fischl, V., 24 (S.S.)
Singh, H., with Linton & Seal, 772 (Chl.)
Singh, S., with Williamson, 413 (Mal.)
Sinha, S. N., with Struthers, 430 (Mal.)
Sinton, J. A., 441, 788, 797 (Mal.)
—— & Ghosh, B. N., 127 (Mal.)
—— & Majid, S. A., 816 (Mal.)
—— & Mulligan, H. W., 122 (Mal.)
—— & Shortt, H. E., 491 (K.A.)
Sitanala, J. B., with Sardjito, 337 (Lep.)
Skorodumov, A., with Dobradin, 451 (Pl.)
Skvortsov, A., 630 (Hel.)
Slatineau, A. & Balteanu, J. with Sibi, M., Nitzulescu, J., Franche, M., Cantacuzino, L., Paraschivescu, Z., Veit, E. & Lupu, D., 469 (Pel.)
——, Ciuca, M., Balteanu, I., Alexa, E., Alexa, I., Francke, M. & Rugina, I., 411 (Mal.)
——, Nicolau, S. & Balmus, G., 741 (Mal.)
—— & Sibi, M., with Francke, M., Veit, E., Lupu, E. & Paraschivescu, Z., 747 (Mal.)
Slot, J. A., (470) (Pel.)
van Slype, W., (445) (Mal.), 694 (S.S.), 645 (Hel.) 828 (Bl.)
——, with Bouvier, 668 (Misc.)
Smith, E. C. & Elmes, B. G. T., 522 (Misc.)
Smith, E. C. T., 116 (Mal.)
Smith, L. E., with Campbell, Sullivan & Haller, 663 (Misc.)
Smith, M. A., 372 (Sn.)
Smith, R. O. A., Krishnan, K. V. & Mukerji, S., 88 (K.A.)
—— & Lal, C., 83 (K.A.)
Smithers, D. W., with Dixon, 631 (Hel.)
Smythe, C. V., with Reiner, 42 (S.S.)
Snijders, E. P., (49) (Sp.)
——, with Dhont & Schüffner, 288 (Y.F.)
——, with Hoffmann & Mertens, 171 (Fev.)
——, Postmus & Schüffner, (295) (Y.F.)
Soegiri, 917 (B.R.)
Soesilo, R., with Walch, 726 (Mal.)
Soetjahjo & Gan Sing Bie, 3 (Bb.)
Sokolov, B., with Yakimoff, (675) (Misc.)
Solana, F. & Gutiérrez-Solana, (873) (Lep.)
Soliterman, P. L., with Krontowsky, Jazimirska-Krontowska & Savitska, 569 (Fev.)
Sollini, A., 890 (Y. & S.)
Solotnitzky, J. N., 473 (Oph.)
de Sommerville, E. T. W., with Dios, Bonacci, Aldao & Barba, 511 (Misc.)
Soni, R. L., 747 (Mal.)
Soper, F. L., (595), 878, (882) (Y.F.)
Sorge, G., 534 (B.R.)
Sorley, J. T., 871 (Lep.)
Soru, E., with Damboviceanu, 461 (Chl.)
Souchard, L., 342 (Lep.)
—— & Ramijean, 342 (Lep.)
Souchkowa, E. G., with Mourzinn, 473 (Oph.)
Soule, M. H., (555) *bis*, 867 (Lep.).
Soulié, P., with Marchal & Grigaut, (279) (Hel.)
Souter, J. C., 185 (Der.)
South African Institute for Medical Research, 66 (Misc.)
Southern Medical Journal, 105 (Mal.)
de Souza-Araujo, H. C., 549 (Lep.)
Sparrow, H., 567 (Fev.)
——, with Nicolle, 158, 560, 578 (Fev.)
Spät, W., (583) (Fev.)
Spector, B. K. & Buky, F., 189 (Am.)
——, Foster, J. W. & Glover, N. G., 773 (Am.)
Spies, T. D., Payne, W. & Chinn, A. B., 468 (Pel.)
Spink, W. W., 268 (Hel.)
Spitzer, 342 (Lep.)
Stabler, R. M., with Arnett, 188 (Am.)
Stahovsky, 473 (Oph.)
Stannus, H. S., (915) (Misc.)
Stefanopoulo, G. J. & Mollaret, P., 284 (Y.F.)
——, with ——, 292 (Y.F.)
——, —— & Desnos, E., 290 (Y.F.)
Stein, A. A., 544, 867 (Lep.)
—— & Steperin, M. I., 338 (Lep.)
Stein, A. K., with Pavlovsky, 672 (Misc.)
——, with —— & Bytschkov, 908 (Misc.)
Steiner, A. & López, C., 608 (Rab.)
Stejskal, K., (754) (Mal.)
Steperin, M. I., with Stein, 338 (Lep.)
Stephens, E. D., with Shortt, McGuire & Brooks, 610 (Rab.)
——, with —— & Poole, 171 (Fev.)
Stephens, J. W. W., 200 *bis* (Bl.)
Stern, R. O., with Findlay, 593 (Y.F.)
Steudel, E., (43) (S.S.), (533) (Misc.), 822 (Bl.)
Stévenel, L., 548 (Lep.)
Stewart, C. M., with Gilbert, 673 (Misc.)
Stewart, F. H., 897 (Oph.)
Stewart, M. A., 667 (Misc.)
——& Boyd, A. N., 665 (Misc.)

Stiles, C. W. & Baker, C. E., 759 (B.R.)
van Stockum, M. J., 612 (Rab.)
Stoker, W. J., 444 (Mal.)
Storm, C. J., 747 (Mal.)
——, with de Langen, 418, 726, (753) (Mal.)
Strachan, P. D., 539 (Lep.)
Strangeways, W. I., 699 (S.S.)
Stratman-Thomas, W. K., 738 (Mal.)
——, with Boyd, 404, 405 (Mal.)
——, with —— & Kitchen, 738 (Mal.)
——, with —— & Muench, 404 (Mal.)
Strauss, M. B., 215 (Misc.)
Streef, G. M., (675) (Misc.)
Strickland, C. & Gibson, D., 140 (Mal.)
Strong, R. P., Sandground, J. H., Bequaert, J. C. & Muñoz Ochoa, M., 300 (B.R.)
Strong, P. S., with Culbertson, 360 (S.S.)
Struthers, E. A. & Sinha, S. N., 430 (Mal.)
Stubblefield, H. I., with Reid, Anderson & Ivy, 194 (Dys.)
Stupnitzki, P. N., with Minerwin & Tinker, 455 (Pl.)
Suarez Peregrin, E., with Lopez Neyra, 224 (Misc.)
Suarez, R. M. & Costa Mandry, O., (675) (Misc.)
Subrahmanyam, S., 413 (Mal.)
Sugio, K., with Suzuki & Matsumoto, 376 (Sn.)
Sullivan, W. N., with Campbell, Smith & Haller, 663 (Misc.)
Summent, P., 873 (Lep.)
Sundararajan, E. R., with Karve, 844 (Pl.)
Sussini, M., Roberto Paso, J. & Puente, J. J., 861 (Lep.)
——, Vaccarezza, R. F. & Alvarado, C. A., 587 (Y.F.)
Suzuki, C., Matsumoto, K. & Sugio, K., 376 (Sn.)
Suzuki, K., 163 (Fev.)
Svensson, R. with Linders, F. J., 220 (Misc.)
Swartzwelder, J. C., with Faust & Scott, 777 (Am.)
Sweeney, M. A., with Walker, (555), 864 (Lep.)
Sweet, W. C., 94 (Mal.)
—— & Dirckze, H. A., 269 (Hel.)
——, with Nursing & Rao, 399 (Mal.)
—— & Rao, B. A., 94 (Mal.)
Swellengrebel, N. H., with de Buck, 137, (444) (Mal.)
——, with —— & Schoute, 137 (Mal.)
—— & Nykamp, J. A., 136 (Mal.)
——, with ——, 136 (Mal.)
Swezey, W. M., with Atchley, 225 (Misc.)
Swynnerton, C. F. M., 368 (S.S.)
Sydenstricker, V. P., with Kelley, 740 (Mal.)
von Szentkirályi, S., 666 (Misc.)
von Szily, A., 897 (Oph.)

T

Taha, S., with Azmy, (198) (Am.)
Takano, S., 767 (Chl.)
Talamonti, L., 187 (Am.)
Talbot, 473 (Oph.)
Taliaferro, W. H. & Taliaferro, L. G., 425 *ter* (Mal.)
Tampi, N. K., 843 (Pl.)
Tanabe, M., 780 (Am.)
Tang, F. F., 472 (Oph.)
Tanganyika Territory, 367 (S.S.)
Tangredi, G., (782) (Am.)
Tani, T. & Ogiuti, K., 57 (Y. & S.)
Tannou, with Pellé, (199) (Am.)
Tao, C. S., with Yu, Chu & Wang, 619 (Hel.)
Tao, S., with Komiya & Kawana, (655) (Hel.)
Tao, S. M., 903 (Misc.)
Tarassow, W., 253 (Hel.)
Tareev, E. M., Bolotina, A., Gontaeva, A., Raskin, A. & Epstein, E., 111 (Mal.)
Tartaglia, P., 81 (K.A.)
Tate, P., with Keilin & Vincent, 912 (Misc.)
—— & Vincent, M., 419, 424 (Mal.)
Taylor, F. H., 660, (675) (Misc.)
Taylor, H. W. Y., 903 (Misc.)
Taylor, J. & Ahuja, M. L., 767 (Chl.)
Tchang, J. & Lotsong, S., 567 (Fev.)
Tegoni, G., with Aureli, B. W., (445) (Mal.)
Teichler, G., 622 (Hel.)
Thaysen, T. E. H., 49 (Sp.)
Theiler, M. & Hughes, T. P., 590 (Y.F.)
—— & Whitman, L., 874, 880 (Y.F.)
Thémelin, 214 (Bl.)
Theodor, O., 491 (K.A.)
——, with Adler, 487 (K. A.)
Thienes, C. H., with Hoyt & Fisk, 618 (Rab.)
Thiodet & Ribère, 791 (Mal.)
Thiroux, A., 553 (Lep.)
Thomas, A. D., with Neitz, 616 (Rab.)
Thompson, E. I. & de Groat, A., (873) (Lep.)
Thompson, H. G., with Li, 628 (Hel.)
Thompson, S. G., Dempsey, J. G. & Toombs, B., (148) (Mal.)
Thomson, J. G., 395 (Mal.)
—— & Lamborn, W. A., 68 (Misc.)
Thorfinn, E., 44 (Sp.)
Tiant y del Río, F. R., with Oteiza y Setién, 855 (Lep.)
Tiburskaya, N., with Agrikolanski, 776 (Am.)
——, with Pikul & Serguiev, 434 (Mal.)
Tillema, S., (754) (Mal.)
Tilli, P., 817 (Mal.)
Timpano, P., 267 (Hel.)
Tinker, J., 849 (Pl.)
Tinker, J. S., with Minerwin & Stupnitzki, 455 (Pl.)
—— & Senkewitsch, M. A., 908 (Misc.)
Tiong, J. O., with Lagrosa, Alonso & Paras, 547 (Lep.)
——, with —— & Disini, 868 (Lep.)
Tirumutri, T. S. & Radhakrishna Rao, M. V., 741 (Mal.)
Tisseuil, J., 278, 649 (Hel.), 543, 550, 870 (Lep.)
Titeca, J., with Baonville & Ley, 693 (S.S.)
Tomb, J. W., 233 (Hel.)
Tompkins, E. H., with Dodd, 219 (Misc.)
Tonking, H. D., 110 (Mal.)
Toombs, B., with Thompson & Dempsey, (148) (Mal.)
Torrealba, J. F., (43), (371) (S.S.)
Torres, A. N., with Freeman, (146) (Mal.)
Tosonotti, T., (279) (Hel.)
Toumanoff, C., 436 *bis*, 438, 727 (Mal.)
—— & Hu, S., 437 (Mal.)
——, with Mesnard, (753) (Mal.)

Tôyama, I. & Ishizu, S., 544 (Lep.)
Trager, W., 912 *bis* (Misc.)
Tramontano, V., with Ninni, 486 (K.A.)
Tran-van-Tam, with Dorolle & Chaussinand, 608 (Rab.)
——, with —— & Ngo-Quang-Ly, 346 (Lep.)
Tran-van-Tu, with Ragiot & Delbove, 157 (Fev.)
Trausmiller, O., 736 (Mal.)
Travassos, J. & Monteiro, J. L., 581 (Fev.)
Treillard, M., 135, 403, 431, 438, 801 *bis* (Mal.), (675) (Misc.)
Trensz, F., 110, 421 *bis*, (754), 790 *bis*, 791 (Mal.)
——, with Sergent, Et., 812 (Mal.)
Trevan, J. W., with Paget & Attwood, 343 (Lep.)
Triaca, J. A., with Niño, (227), (674) (Misc.)
van Tricht, B., 514 (Misc.)
Trimble, H. E. & Sherrard, G. C., 848 (Pl.)
Troisier, J., Bariéty, M. & Brouet, G., 602 (Lept.)
Trowell, H. C., 500 (Misc.)
Truong-van-Que, with Montel, 346, 549, (555) (Lep.)
Tschan Tsching, J., with Otto, 630 (Hel.)
Tseng, H., 713 (S.S.)
Tsuchiya, H., 192 (Am.)
Tsuge, Y., (782) (Am.)
Tsuji, H., 257 (Hel.)
Tsurumi, M., 844 (Pl.)
Tubangui, M. A., Basaca, M. & Pasco, A. M., 234, 635 (Hel.)
Tudoranu, G., Herescu, D. & Grinberg, A., 128 (Mal.)
Turewitsch, E. I., with Epstein & Exemplarskaja, 161 (Fev.)
Turner, T. B., 887 (Y. & S.)
—— & Chesney, A. M., 57 (Y. & S.)
——, with Kumm & Peat, 886 (Y. & S.)
—— & Saunders, G. M., 883 (Y. & S.)
——, with ——, 794 (Mal.)
——, —— & Johnston, H. M., Jr., 50 (Y. & S.)
Tuxford, A. S., 644 (Hel.)

U

Udaondo, C. B., Sanguinetti, L. V. & Zunino, L. V., 179 (Rab.)
Ueda, M., with Yoshida, 162 (Fev.)
Uganda Protectorate, 673 (Misc.)
Uhlenhuth, P., (445) (Mal.), (533) (Misc.)
—— & Zimmermann, E., 600 (Lept.)
Ukil, A. C. & Chowdhury, S. C., (148) (Mal.)
Union of South Africa, 332 (Lep.), 393 (Mal.)
Universidad Buenos Aires Misión de Estudios de Patologia Regional Argentina Jujuy, 36, 37, (43) *bis*, (371) (S.S.)
Urabe, K., (456) (Pl.)
Urbach, J., 468 (Pel.)
Urechia, C. I. & Dragomir, L., (675) (Misc.)
Uriarte, L., (456) (Pl.)
——, with Calcagno, B., Riesel, M. & Anchezar, B., 447, (456) (Pl.)
Uyeda, S., 462 (Chal.)
Uyeno, H., 251 *bis*, 630 (Hel.)

V

Vaccarezza, R. F., with Sussini & Alvarado, 587 (Y.F.)
Vaisman, A., with Levaditi & Paic, 298 (R.F.)
Valenza, J., 713 (S.S.)
Van den Bergh, A. A. H., (49) (Sp.)
Van den Berghe, L., 242 (Hel.)
——, with Kotter, 880 (Y.F.)
Van den Branden, F., 16, 354, 711, 712 (S.S.)
—— & Appelmans, M., 695 (S.S.)
——, with Duren, 349 (S.S.)
—— & Pottier, R., 355 (S.S.)
Van der Horst, G. A. & Verhaart, W. J. C., 408 (Mal.)
Varela, G. & Gay, M. A. P., 160 (Fev.)
——, ——, & Aguayo, M., 564 (Fev.)
Vasilescu, C. & Papazian, R., (782) (Am.)
Vassiliadis, P., (772) (Chl.)
Vassiliadis, P. C., 771 *bis* (Chl.)
Vassilkova, Z., 232 (Hel.)
van Veen, A. G., 4 (Bb.)
—— & Koks, M. T., 5 (Bb.)
Vaucel, M. & Hasle, G., 566 (Fev.)
Vaudremer, A. & Brun, C., 865 (Lep.)
Vegas, M., with De la Plaza & Gomez, 871 (Lep.)
Veit, E., with Slatineanu, Balteanu, Sibi, Nitzulescu, Franche, Cantacuzino, Paraschivescu & Lupu, 469 (Pel.)
Velasco, F., 334 (Lep.)
Velasco, R., with Savoor, 159 (Fev.)
Vellard, J. & Miguelotte-Vianna, M., 380 (Sn.)
Vellard, J. A. & Vianna, M. M., 376 *bis* (Sn.)
Velu, H., 631 (Hel.)
Vengsarkar, S. G., Raghavan, P. & Godbole, G. B., (228) (Misc.)
Venkatachalam, K. & Ratnagiriswaran, A. N., 378 (Sn.)
Venkataraman, K., with Ratnagiriswaran & Sehra, 622 (Hel.)
Venkatraman, K. V., with Gardner, 461, 768 (Chl.)
de Vera, B., with Lara, 544, 862 (Lep.)
Verhaart, W. J. C., 177 (Rab.)
——, with Van der Horst, 408 (Mal.)
Vernes, A. & Koressios, N. T., 378 (Sn.)
Verslagen en Mededeelingen Betreffende de Volksgezondheid, 104 (Mal.)
Viala, J., 178 (Rab.)
Vianna, M. M., with Vellard, 376 *bis* (Sn.)
Vickers, W. J., 139 (Mal.)
——, West, G. F. & d'Netto, S. G., 139 (Mal.)
Vickery, D., with Shipton, (753) (Mal.)
Viglietta, C., 243, 623 (Hel.)
Vigne, P., with Giraud, 84 (K.A.)
Villain, G., 297 (R.F.)
——, Dupoux, R. & Marini, C., 805 (Mal.)
Villegas, C., 720 (S.S.)
Villela, E. & Dias, E., 366 *bis* (S.S.)
Vincent, M., with Keilin & Tate, 912 (Misc.)
——, with Tate, 419, 424 (Mal.)
Vincke, I. & Henrard, C., 100 (Mal.)
Vogel, C. W. & Cadwallader, C., 847 (Pl.)
Vogel, H., 251, (656) (Hel.)
——, Wu, K. & Watt, J. Y. C., 619 (Hel.)
de Vogel, W. T., 874 (Y.F.)

Voigt, E. M. & Voigt, C., 213 (Bl.)
Vos, J. J. T., with Noosten & Kirschner, 73 (Misc.)
Voss, J. A., 270 (Hel.)
Vo-Van, C., 231 (Hel.)
Vu-Dinh-Tuan, 827 (Bl.)

W

Wade, H. W., 336, (555) *bis*, 862 (Lep.)
—— & Le Roux, J. J. du P., 544 (Lep.)
de Waele, A., 255 (Hel.)
Wagner, O., 629 (Hel.)
Wakil, A. W., 506 (Misc.)
Wallace, J. M., with Duke & Mettam, 33 (S.S.)
Walandouw, E. K., 256 (Hel.)
—— & Walch-Sorgdrager, G. B., 727 (Mal.)
Walch, E. W. & Soesilo, R., 726 (Mal.)
Walch-Sorgdrager, G. B., with Walch, 727 (Mal.)
Walker, E. L. & Sweeney, M. A., (555) 864 (Lep.)
Walker, J. & Mathieu, V., 892 (Y. & S.)
Wallace, J. M., 359 (S.S.)
——, with Duke & Mettam, 33 (S.S.)
Walters, A. H., 274 (Hel.)
Walton, A., 759 (B.R.)
Wang, C., with Yu, Chu & Tao, 619 (Hel.)
Warma, J. D., 489 (K.A.)
Wassén, A., 765 (Chl.)
Wassilieff, A., 133, 431 (Mal.)
Watanabe, M., 252 (Hel.)
Watanabe, Y., 347, 865 (Lep.)
Wats, R. C. & Ghosh, B. N., 749 (Mal.)
Watson, M., 725 (Mal.)
Watson, W. H., 643 (Hel.)
Watt, J. Y. C., 224 (Misc.)
——, with Vogel & Wu, 619 (Hel.)
Wayl, P., 206 (Bl.)
Wayson, N. E., 335 (Lep.)
—— & Rhea, T., 541 (Lep.)
Weber, P. P., 821 (Bl.)
Webster, L. T. & Dawson, J. R., Jr., 608 (Rab.)
Weinberger, H. L., 196 (Dys.)
Wells, J. W., with Faust, Adams & Beach, 267 (Hel.)
Wenckebach, K. F., 79 (B.R.)
Werner, H., 65 (Misc.)
West, G. F., with Vickers & d'Netto, 139 (Mal.)
Westerlinck, H., with Dubois & Degotte, 546, 870, 873 (Lep.)
Westphal, A., 659 (Misc.)
Weyer, F., 137 (Mal.), 664 (Misc.)
Whitby, L. E. H., with Moncrieff, 72 *bis* (Misc.)
White, R. S., 428 (Mal.)
—— & Adhikari, A. K., 141 (Mal.)
Whitfield, F. G. S., & Wood, A. H., 916 (B.R.)
Whitman, L., 879 (Y.F.)
——, with Theiler, 874, 880 (Y.F.)
Wickramasuriya, G. A. W., 639 (Hel.)
von Wikullil, L., (533) (Misc.)
Williams, A. W., 452 (Pl.)
Williams, D. P. & Bhattacharyya, R., 417 (Mal.)
Williams, F. E., Freeman, M. & Kennedy, E., 374 (Sn.)
Williams, L. L., Jr., 432 (Mal.)
Williamson, H. & Singh, S., 413 (Mal.)
Williamson, K. B., 429, 727 (Mal.)
Willoughby, W. M., 850 (Pl.)
Wilson, D. B. & Wilson, M. E., 109, 735 (Mal.)
Wilson, P. W., 53, 894 (Y. & S.)
Wilson, R. M., 858 (Lep.)
——, with Kang, 540 (Lep.)
Wilson, R. P., 475, 477 (Oph.)
Winckel, C. W. F., 128 (Mal.)
Winter, H. G., 95 (Mal.), 176 (Rab.)
Wiseman, R. H., 130 (Mal.)
Wolf, M., 891 (Y. & S.)
Wolff, 521, 522 (Misc.)
Wolff, E., 899 (Oph.)
Wolff, J. W. & Kouwenaar, W., 579 (Fev.)
——, with ——, 578, 579 (Fev.)
——, with —— & Maasland, 521, (532 *bis*) (Misc.)
Wood, A. H., with Whitfield, 916 (B.R.)
Wood, F. D., 364, 365 (S.S.)
Wright, H. E., with Kemp & Moursund, 296 (R.F.)
Wright, R. E., 474, 477, 895, 898 (Oph.)
——, Nayar, K. K. & Nayudu, T. V., 476 (Oph.)
Wu, C. C., with Yao, 726 *bis* (Mal.)
Wu, C. Y., 841 (Pl.)
——, with Wu Lien-Teh, 758 (B.R.)
Wu, K., with Vogel & Watt, 619 (Hel.)
Wu, L. C., 646 (Hel.)
Wu, S., with Li, 661 (Misc.)
Wu, T. T. & Chi, C. K., 775 (Am.)
Wu-Lien-Teh, 152 (B.R.), 841 (Pl.)
—— & Wu, C. Y., 758 (B.R.)
Würmser, L., with Laignel-Lavastine & Koressios, 378 (Sn.)
Wynne, A. M., (445) (Mal.)
Wynns, H. L. & Beck, M. D., (599) (R.F.)

Y

Yacob, M. & Chaudhuri, J. R., 638 (Hel.)
Yakimoff, V. & Sokolov, B., (675) (Misc.)
Yamamoto, Y., (782) (Am.)
——, with Buto, (92) (K.A.)
Yamanaka, S., with Kojima & Kyu, 166 (Fev.)
Yang, C. & Huang, K. K., 466 (Pel.)
Yang, F. H., 913 (Misc.)
Yang, Y. N., 761 (Chl.)
Yao, Y. T., & Chu, H. J., 619 (Hel.)
——, Hsu, S. C. & Ling, S. C., 619 *bis* (Hel.)
—— & Jung Sun, C., 726 (Mal.)
—— & Ling, L. C., 726 (Mal.)
—— & Wu, C. C., 726 *bis* (Mal.)
Yatsenko, F., Paretskaya, M. & Kipritch, S., 666 (Misc.)
Yawt, N., with Galt, 334 (Lep.)
Yen, A. C. H. & Chung, H., 91 (K.A.)
Yen, C. H., with Hu, 646 (Hel.)
Yenikomshian, H. A., 70 (Misc.)
Yofé, H., (445) (Mal.)
Yokogawa, S., 266 (Hel.)
Yorke, W., with Lourie & Murgatroyd, 697 (S.S.)

Yorke, W., & Murgatroyd, F., 518 (Misc.)
——, with —— & Russell, 26 (S.S.)
Yoshida, S., 619 (Hel.)
—— with Kasahara & Okamoto, 566 (Fev.)
—— & Ueda, M., 162 (Fev.)
Young, S., (656) (Hel.)
Yu, K. Y., 333 (Lep.), 467 (Pel.)
Yu, T. H., Chu, P. J., Wang, C. & Tao, C. S., 619 (Hel.)
Yuyama, H., 866 (Lep.)

Z

Zangri, G., 534 (B.R.)
Zertchaninov, L., 781 (Am.)
Zia, L. S. & Forkner, C. E., 482, 483 (K.A.)
——, with ——, 479 (K.A.)
Zia, S., 162 (Fev.)
Ziemann, H., (533) (Misc.)
Zimmerli, E., (599) (R.F.)
Zimmermann, E. & Arjona, E., 601 (Lept.)
——, with Uhlenhuth, 600 (Lept.)
Zinsser, H., 154, 563 (Fev.)
Zolotarev, N. A., 909 (Misc.)
Zotta, with Martini, 101 (Mal.)
Zuccarini, J. A., with Fülleborn & Dios, 637 *bis* (Hel.)
Zumpt, F., 722 (S.S.)
Zunino, L. V., with Udaondo & Sanguinetti, 179 (Rab.)

INDEX OF SUBJECTS.

(The entries in heavy type refer to Sections in which abstracts on the subject indicated are grouped together.)

Acariasis, intestinal, 671
Acclimatization of white races in tropics, 65, 510, 511
Acremoniella rugulosa causing mycosis of bone, 218
Actinomycosis
  in Algeria, 530
    Peiping, China, 183
Aëdes aegypti, and see Yellow fever
    biology, 134, 292, 593, 594, 912
    comparison of geographical races, 292
    egg-laying capacity and longevity of adults, 593
    incubation period of yellow fever virus in, 592
    influence of bacteria on egg hatching and larval development, 134, 594, 912
    occurrence of yellow fever in absence of, 586, 878
  scapularis possibly transmitting yellow fever, 586
  scutellaris wrongly reported from Hangchow, 661
Africans, medical training of, 500
Ainhum
  in Tripolitania, 520
  resembling leprosy, 862
  treatment with iodide as analgesic, 520
Allergy, skin, in trematode infections, 629
AMOEBIASIS, amoebic dysentery, amoebic liver abscess, etc., 187–193, 773–782
  in Armenia, 67
    Formosa, 187
    Italian Somaliland, 187
    Japan, Kyusu district, 187
    Manchukuo, 510
    Mexico, Zacatecas State, 188
    U.S.A., in American Indian children, 188
      Philadelphia, 188
      Tennesse, 190, 779
Amoebiasis, *see also Entamoeba histolytica*
  and amoebic dysentery (book review), 301
  cirrhosis of liver and, 71
  diagnosis,
    complement fixation, 192
    of unrecognized cases in other diseases, 773
  enteritis, giardial and trichomonal, in relation to amoebic dysentery, 197
  liver abscess, 774
  mixed infection with bacillary dysentery, 196
    with giardia and trichomonas, 197
  non-dysenteric, 191
  pathology,
    in dogs, 190, 777
    in cats, 190, 778, 779
    in man, 190, 191
  pigs, search for cysts in, 193, 779, 780
Amoebiasis—*cont.*
  titles of unnoticed papers, 197–199, 781–782
  treatment,
    camphosulphonate (emetine salt), 776
    emetine, 196, 775
    gavano, 775
    iodaseptine cortial (iodobenzomethylformine), 776
    iodo-oxyquinoline hydrochloride (vioform) 191, 775
    mixiod, 775
    rivanol, 196
    stovarsol (" osarsol "), 776
    vioform, 191, 775
    yatren, 196
  experimental
    arsenious trithio salicylic acid, 191
    carbarsone, 191
    kurchi bismuth iodide, 191
    liver extract, 191, 778
    liver, raw, 191, 777
    proparsamide, 191
    salmon, canned, 777
    ventriculin, 191, 777
  of uterine cervix, 775
Anaemia
  Cooley's, 72
  in Egypt, 527
  pernicious, rôle of gastro-intestinal tract in, 215
Ancylostoma, see also Hookworm disease, *and Necator*
  caninum,
    blood picture in fatal infestations with, 641
    direct development after oral infection, 265
    effect of deficient diet on resistance of dogs to, 641
    migration in proper and improper hosts, 266
  duodenale,
    longevity and rate of loss in man, 258
Anopheles, *see also* Malaria ; Mosquitoes
Anopheles of,
    Africa, 438
    Algeria, 99, 805
    Belgian Congo, Leopoldville, 100
    Brazil (*Nyssorhynchus* group), 440
    China
      Hong Kong, 436, 731
      Shanghai, 99, 437
      Shantung Province, 802
      Yunnan Province, 802
    Dutch Indies, 731
    Federated Malay States, Kuala Lumpur, 139
    Germany, Mecklenburg, 137
    Greece, 440, 806, 807
    Holland, 136, 137

Anopheles of—*cont.*
India, 435
Anaimallai Hills, 804
Calcutta, 398, 428
Delhi, 428
Lower Bengal, 803
Mysore State, 94, 399
Patna, 398
Indo-China, 133, 135, 437, 731, 801, 802
synoptic tables, 438, 801
Panama, Chiriqui Region, 806
Philippines, 97, 98, 402, 440, 803, 816
South Africa, 133
Tunis, 133, 805
Turkmenistan, Karakala Region, 802, 907
Uganda, 673
U.S.A., Houston, Texas, 442
Venezuela, 439
Yucatán, 101
Anopheles
activity in relation to climate, 440, 442, 805
breeding,
chemical factors affecting, in Trinidad, 439
in relation to rice cultivation, 730, 803
control,
drainage, 140, 430, 432, 729
subsoil, 139, 429
fish breeding, 94, 729, 736, 819
fumigation, 431, 818
" herbage cover " (rotting vegetation), 429
in houses, 105, 431, 818
larvicides,
ammonia nitrogen, 439
anthracene, 145
calcium cyanamide, 817
chlorpicrine, 145
copper arsenite, 431
Enterolobium timbouva Mart., 145
metallic poisons, 429
Paris green, 741
distributing machine for, 144, 730
floatation of, 431, 817
spread by aeroplanes in Madagascar, 144
oiling, 730
" brush oiling," 140, 143
" oil balls," 818
screening, 107, 146
sluicing, 139, 429, 430
spraying, 105
insecticide spray for dwelling-houses in Holland, 105
in Philippines, 98
trapping, 818
zooprophylaxis, 432, 436
eggs of Netherlands Indies species, 731
of South African species, 133
of West African species, 134
flight ranges of, 105, 107, 108, 440
insectary rearing of, 135, 806
larvae, development in sewage, 808
macroscopic identification, 135
transportation by running water, 134, 816
nematode parasites of, 256
Anopheles—*cont.*
somatic characters changed by bonification, 136
sporozoites in, vital staining of, 128
synoptic tables of Indo-Chinese species, 438, 801
Anopheles albimanus, flight distances of, 107, 108
bifurcatus, biology in Turkmenistan, 907
cinereus, eggs of, 133
crucians and *A. quadrimaculatus*, relative susceptibility to malaria parasies, 404
culicifacies, control in Ceylon, 732, 733, 820
effect of ammonia on oviposition, 808
longevity, 435
and malaria in Indo-China, 801
funestus in S. Rhodesia, 804
var. *confusus* in S. Rhodesia, 804
var. *rivulorum* in S. Rhodesia, 804
gambiae and malaria in Leopoldville, Belgian Congo, 100
hyrcanus var. *sinensis*, breeding at 2,400 metres, 802
carrier of *Mf. malayi*, 647
and malaria in Nanking, 730
and malaria in Tonking, 403
zoophily of, 437
jeyporensis and malaria in Travancore, a correction, 738
leesoni in S. Rhodesia, 804
leucosphyrus and malaria in Borneo, infection rate, 444
maculatus and malaria in Philippines, 98
maculipennis
cross-breeding, experiments between races of, 137, 443
egg characters diagnostic of races of, 138
hibernation in larders in Tunis, 133
invading Wieringermeerpolder, Holland, 136
larvae, and gills, 908
oekology in relation to vegetation, 443
quantitative method of capture, 907
races, 138
Algeria, 812
Calabria, 815
Corsica, 403
Europe, 809
France, 442, 812
Greece, 440
Italy, 809, 815
Mecklenburg, 137
Mexico, 816
Morocco, 814
Netherlands, Western, 137, 805, 835
Rumania, 101
Sweden, 812
Tunis, 813
U.S.S.R., 907
Ural Province, 815
race *atroparvus*, 137, 138, 443, 809, 811, 813, 814
blood preference, 815
length of flight, 814
winter habits changed by artificial conditions in Holland, 137
race *aztecus*, 816
race *elutus*, 809, 811, 813, 815
race *fallax*, 442, 443

Anopheles maculipennis—cont.
race *labranchiae*, 443, 809, 811, 812, 813, 815
race *maculipennis* (*typicus*), 137, 443, 809, 811, 812, 815
race *melanoon*, 809, 811, 813
race *messeae*, 137, 809, 811, 812, 815
winter habits changed by artificial conditions in Holland, 137
race *sicaulti*, 812, 814
minimus, and malaria in Philippines, 98, 816
effect of humidity and longevity on malaria infectivity in Indo-China, 135
philippinensis, and malaria around Bernagar, Bengal, 435
plumbeus, biology, 807
punctipennis, insectary rearing of, 135, 806
punctulatus, wrongly reported from New Caledonia, 661
quadrimaculatus, breeding places in Houston, Texas, 442
hibernation, 106
insectary rearing of, 806
and malaria in Florida, infection rate, 404
in Mexico, 816
rossii (*subpictus*), character of Indo-Chinese representatives, 438
effect of ammonia on oviposition, 808
longevity, 435
sacharovi, and malaria in Uzbekistan, 734
sinensis, breeding at 2,400 metres, 802
tarsimaculatus, chemical factors affecting breeding in Trinidad, 439
vagus, effect of humidity and longevity on malaria infectivity in Indo-China, 135
Anophelism *sine* malaria in Corsican mountain village, 800
Anthelmintic medication,
principles and theories, 229, 233
tests *in vitro*, 236, 237
Anthelmintics
alkyl phenols, 237
Calycopteris floribunda leaves, 622
carbon tetrachloride, poisoning, 621
chenopodium oil, 235
copper (cupronat), 237
fouadin, 235, 236
hexylresorcinol, 234
tetrachlorethylene, 235
Vangueria edulis decoction (Edulin), 622
Antitoxins, duration of activity, 217
Appendicitis and helminths, 230, 244, 627, 634
Ascariasis,
in China, 256
Philippines, 635
U.S.A., Mississippi, 230
aberrant case, 257
diagnosis, 636
of the liver, 636
mimicry in, 636
pathology and complications, 257
treatment,
chenopodium oil, 230
Ascariasis—*cont.*
treatment—*cont.*
6-hexyl-meta-cresol, 635
hexylresorcinol, 229, 234
ortho-heptylphenol, 635
santonin, 230
torilol from *Torilis anthriscus* in Japan, 257
Ascaris, resistance of egg to heat and chemicals, 256
Ascaris lumbricoides
in bronchi causing pulmonary abscess, 636
skin reactivity to, in rabbits, 636
Ashford, Bailey K., Autobiography of (book review), 149
Athlete's foot, 185
Atrax robustus, venom of, 672
Australia's orientation, 510
Australorbis glabratus, intermediary of *S. mansoni* in Porto Rico, 245, 625
Bacteria, effect on development of mosquito larvae, 134, 594, 913
influence on cultures of Trypanosomidae, 223
Bacterial food poisoning, treatment by kaolin, 72
" Bakandjia " and yellow fever protection test, 875, 881
Balantidium from chimpanzee, its conjugation, 225
Balantidium coli of macaques, 222
Bartonella bodies in induced anaemia in dog, 906
Bartonella muris infection, action of Std. 386 B. on, 227
muris ratti, globular inclusions in guineapigs resembling, 226
Bat as a vector of rabies, 607
as vector of *T. cruzi* in Argentine, 717
as vector of *T. hippicum*, 512
Bed-bugs in relation to temperature and humidity, 669, 670, 913
Bed-Side Medicine (book review), 464
Beetle dermatitis in Brazil, 671
BERI-BERI AND EPIDEMIC DROPSY, 1–7
adrenalin test, 1, 3
aetiology, 1
drastic voluntary dietary restriction, 4
primary and secondary causes, 1, 2
rôle of gastro-intestinal tract, 215
or epidemic dropsy in African child, 7
in Bengal, 523
Calcutta, 6
in infants, 5
heart in (book review), 79
in pregnancy and puerperium, 5
and rice
Claytonized, 5
washed compared with steamed, 5
titles of unnoticed papers, 7
treatment,
pineapple juice, for dropsy, 72
vitamin B, oral compared with parenteral administration, 3
vitamin B_1 content
in pregnant rabbits, 5
of rice, 5
Bilharzia *see* Schistosoma, Schistosomiasis
Blacktongue in dogs *see* Pellagra

BLACKWATER FEVER and haemoglobinuria, 200–214, 821–834
in America, Central, 200
America, South, 200
British Guiana, 214
in children, 200
Colombia, 208
Gold Coast, 202
Indian frontier, 202, 823
Nyasaland, 397
Palestine, 205, 206
Philippines, 205
Tonking, 827
West Indies, 200
AsH_3 poisoning resembling, 202
atebrin as excitant, 207, 826
bile in, bilirubin content of, 829
biochemical observations, 210, 828
blood in, 210, 211, 212, 828, 829, 830, 832
alkali reserve, 830
bilirubin, 829, 830
cholesterol, 830
haemoglobin, 211, 829, 832
met-haemoglobin, 211, 829
oxy-haemoglobin, 211, 829
new pigment described, 210, 828
reticulocytes, 832
urea, 830
haemoglobinuria in, 210, 212, 828
haemoglobinuria, discussion, 821
following haemoglobin injection, 212
following malaria therapy, 825
on Indian frontier, 202, 823
rôle of Bowman's capsule in, 821
haemoglobinuria of monkeys,
reticulo-endothelial system in, 832
spleen in, 832
haemolytic agent, nature of, 830
immunity, 214
malaria in relation to, 200, 822
damaged liver as excitant, 201
met-haemoglobinaemia in, 210, 212, 828
myoglobinurias of animals, 821
oxy-haemoglobinaemia in, 210, 212, 828
pathogeny, 205, 821, 823, 824
plasmoquine poisoning resembling, 203, 419
prognosis, 407
quinine in relation to, 822
prophylaxis, biocholine in, 827
reticulo-endothelial system in malarial haemoglobinuria of monkeys, 832
spleen in, 823, 832
titles of unnoticed papers, 214, 834
treatment by
alkalies, 208
atebrin, 201, 207, 825, 826
biocholine, 827, 829
blood tranfusion, 214
calcium, 828
campolon, 201, 202
choline chlorhydrate, 824, 827
liver extract, 826
quinacrine, 210
quinine, 822
colloidal, 206
serum, antihaemolytic, 213
sodium bicarbonate intravenously, for urinary suppression, 208
urotropine, 827
Blanfordia genus, notes, 246, 655
Blastomycosis,
in Algeria, 529
in Costa Rica, 181
fungi from blastomycosis cutis and blastomycosis pulmonalis, 181
Gilchristia dermatitidis, characters of, 181
skin tests with blastomycetin, 181
Blood,
erythrocytes, meteorologic effects on sedimentation rate, 217
influence of haemoglobin on culture of Trypanosomidae, 223
polynuclear count in Iraq, 528
Blood smears, thick film technic, 904
Bodo caudatus, action of immune serum produced in rabbits by injection of, 223
Bone mycosis due to *Acremoniella rugulosa*, 218
BOOK REVIEWS, 75–80, 149–152, 300–308, 463–464, 534, 603–604, 676, 755–760, 835–840, 916–918
Boomerang legs and yaws, 891
Borna's disease and rabies, 618
Boutonneuse fever, *see under* Typhus group of fevers
Brachytarsomys albicauda, plague infected, 449
Brill's disease, *see under* Typhus group of fevers
Bulinus contortus, intermediary of *Schistosoma bovis* in Tunis, 243
Calabar swelling *see Loa loa* infection
Calcutta, Conference of Medical Research Workers, 1934, 755
Calcutta School of Tropical Medicine 1920–1933 : an Essay Review, 75
Annual Report, 1934, 756
Calliphora erythrocephala larvae, action of salivary secretion on skin, 908
Calycopteris floribunda leaves as anthelmintic, 622
Cancer and helminths, 627, 646
in Nigerian natives, 522
Candida montpellieri n. sp., 529
CARRION'S DISEASE, 227, 583–584
treatment by salvarsan, 584
by Std. 386B, 227
and typhus, 583
Cat, helminths of, in China, 620
Cataract in Chinese at Peiping, 474
infra-red rays and, 898
senile, operation end results, 474
subcapsular in osteomalacia, 474
Ceratophyllus acutus, plague vector for ground squirrels in California, 848
Cestodes, wanderings of, 256
Chagas' disease, *see* Trypanosomiasis, human, American and *Trypanosoma cruzi*
Chemotherapy, biological problems in, 518
Chigoe flea, introduction to Abyssinia, 672
Children in tropics, British and Dutch contrasted, 514
Chilomastix in man in Granada, new species [?], 224
Chimpanzees, intestinal protozoa of, 220
CHOLERA, 457–462, 761–772
in China, 761
India, 761
bacteriophage in, 454, 460, 461, 762, 764
action on *V. cholerae* in vitro, 461

Cholera—*cont.*
bacteriophage—*cont.*
use in Assam, 460
use in Madras, 454, 460
carriers, 457, 763, 764
entering Ceylon from Mandapam camp, S. India, 763
at Tor in pilgrims from the Hejaz, 763
diagnosis
by differential separation of bacteria, 765
serological, dried standard " O " antigen for, 459
endotoxin, action on abdominal sympathetic system, 766
Far Eastern Association of Tropical Medicine, round table discussion, 762
kidney changes, 764
mortality, effects of bacteriophage, essential oils and vaccination on, 460
Office International d'Hygienè publique, Paris, Commission's report, 459
prophylaxis by bacteriophage, 460, 762
titles of unnoticed papers, 462, 772
treatment,
bacteriophage, 460, 762
concentrated saline, 764
essential oils, 460
serum, 459
vaccine, 460
vibrio(s)
antigens, 769
classification,
blood reactions, 762
milk reactions, 762
filtrates, Shwartzman's phenomenon, 462, 772
isolated at Mandapam Camp, S. India, 763
at Tor from pilgrims from the Hejaz, 763
serological relations, 767, 769
V. cholerae
action on, of bacteriophage *in vitro*, 461
antigenic structure, 461, 768
and El Tor receptors, 771
haemolysins of, 771
haemolysins of, under influence of bacteriophage, 772
immunological variability of, 767
skin reactivity to filtrates of (Shwartzman's phenomenon), 462, 772
V. cholerae typus endemicus, 457, 459, 764
V. cholerae typus epidemicus, 457, 459, 764
El Tor, 457, 458, 459, 764
haemolysin of, 771
receptors, 771
Chrysomyia putoria causing intestinal myiasis, 668
Chrysopa larvae, skin reaction to, 666
Ciliates, enumeration method, 225
Cimex hemiptera, influence of low temperatures on, 670, 913
lectularius, attempts to transmit São Paulo typhus by, 580
multiplication and death at various temperatures, 669
rotundatus, *see C. hemiptera*
Cirrhosis of liver in Lebanon and Syria, 70
and malaria, 741
Citellus pygmaeus, life cycle and leucocyte picture in hibernation, 849
CLIMATIC BUBO, 497–499
in Belgian Congo, 498
Cochin-China, 498
India, Madras, 497
tabes and, 499
treatment,
aspiration, 499
protein shock (T.A.B. intravenously), 498
pyrifer, 498
Clonorchis infection in rabbits, sugar metabolism, 630
Clonorchis sinensis infection, rabbit kidney changes in, 251
treatment by gold injections, 630
Coastal fever at Tully, N. Queensland, 905
Coccidia of man, 221, 660, 904
rôle of flies in spread of, 660
Cochliomyia hominivorax, correct name of screw-worm fly, 665
Colonization of Espirito Santo, Brazil, by Germans, 65
of North Queensland, 65
Conjunctivitis, catarrhal diphtheritic, 471
kerato-, bacteriology of, 895
in Mzab, Algerian Sahara, 62
protecting against gonorrhoea, 509
uniocular from peat dust in California, 471
Conjunctivoplasty, 471
Cooley's anaemia, 72
Corneal grafting, 898
CRITICAL REVIEWS, 309–327, 385–390
Crotalus adamanteus, enzymes and toxic principles of venoms of, 377
Cryptococcus farciminosus and *C. muris*, relation to Histoplasma, 905
Ctencocephalides canis, attempt to transmit yellow fever by, 294
Culex, sulphur compounds, as larvicides, 663
Culex fatigans, susceptibility to *Wuchereria bancrofti* infection, 646, 647
pipiens
fat loss during hibernation, 912
oviposition, effect of shade on, 911
susceptibility to *Plasmodium cathemerium*, 425
Plasmodium relictum, 424
Wuchereria bancrofti, 646
Culicidae of Australia, check list, 660
Cyclops, nematode larvae in,
detection of, 653
influence of bile on, 654
mode of entry of, 653
Cysticercosis, *see also Taenia*
epilepsy in, 631
Cysticercus bovis in calf liver, 632
cellulosae, effect of cooking on, 631
in eye of man, 255, 475
fasciolaris, passive immunity to, in rats, 255
transmission, of immunity to, to offspring, 634
pisiformis, function of bile in evagination, 255
Deficiency disease, rôle of gastro-intestinal tract in, 215
DENGUE AND SANDFLY FEVER, 171–172

Dengue
in Calcutta city, 515
" fièvre rouge " in Guadeloupe compared with, 171
in Mediterranean Basin, 171
title of unnoticed paper, 172
virus from Java infecting volunteers in Amsterdam, 171
Dermatobia hominis in Panama, 667
DERMATOLOGY, TROPICAL, 181–186, *see also under names of diseases, e.g.,* Actinomycosis
Dermatoses, light-sensitive, 531
Desmodus rotundus murinus, vector of *Tryp. hippicum,* 512
Dibothriocephalus latus, see Diphyllobothrium latum
Dicrocoelium lanceatum, eggs in fly droppings, 233
life cycle, 630
Dinopsyllus lypusus, a plague carrier in Madagascar, 449, 847
Diphyllobothrium latum,
antigen, 633
control in N.W. Russia, 253
Dirofilaria immitis, periodicity after blood transfusion, 277
Dog, helminths of, in China, 620
as host of *Dracunculus medinensis,* 653
as host of *Tryp. cruzi,* 37
Dracontiasis,
intradermal test for, 654
in N. Nigeria, 654
in Turkestan, dogs as reservoir, 653
unusual case, 279
Dracunculus medinensis
experimental infection of dogs with, 653
larvae in Cyclops,
influence of bile on, 654
mode of entry, 653
Dropsy, epidemic, 6–7, 523
or beriberi in African child, 7
in Bengal, 523
in Calcutta, epidemiology, 6
Dysentery, amoebic *see* AMOEBIASIS
Dysentery, bacillary, 193–195
bacteriophage in diagnosis, 193
Flexner, Type " Z " infection, 194
mixed infection with amoebic dysentery, 196
prophylaxis,
sodium thiocyanate as antidote for *Bact. shigae* toxin, 194
vaccination, oral, 195
titles of unnoticed papers, 197–199, 781–782
treatment,
bismuth and opium, 196
magnesium sulphate, 196, 197
rivanol, 196, 197
yatren, 196, 197
" yekiri," oral vaccination against, 195
Dysentery, giardial, 197
in children in Bern, 197
treatment,
myosalvarsan, 197
neosalvarsan, 197
spirocid, 197
stovarsol, 197
Dysentery, mixed and unclassed, 195–197
in children, post-dysenteric oedema, 773
in Quetta, among troops, 195
Ear, " hot weather," in India, 73
Echinococcus, *see also* Hydatid disease
antigen, 633
Eclampsia, visual changes in, 476
Elephantiasis, *see* Filarial lymphangitis
Elephantiasis nostras (Non-filarial elephantiasis), 73
Embadomonas intestinalis, culture, 225
sinensis, refound in China, 224
Entamoeba coli, viability of cysts on hands, 189, 773
hartmanni, biometrical study of cysts, 780, 781
histolytica, see also under Amoebiasis
in Formosa, 187
Migiurtinia, Italian Somaliland, 187
Philadelphia students, 188
Tennessee, 190, 779
biometrical study of cysts, 780, 781
in cultures
action of emetine and yatren *in vitro,* 776
effect of temperature on, 192
medium for cultivation, 192
pathogenicity for cats, 778, 779
differentiation from cysts of *E. hartmanni* and *E. dispar,* 780, 781
in drainage water, growth and encystment, 192
of macaques, 222
in pigs, attempts to infect with human strain of, 779
search for four-nucleated cysts, 193, 780
in rats, excystation in intestine, 780
viability of cysts on hands and under finger nails, 189, 773
Enteric fever, post-war, laboratory observations on, 903
Enteritis, giardial and trichomonal, and amoebic dysentery, 197
Enterobius vermicularis infection,
and appendicitis, 230
chronic salpingitis in, 646
Enterolobium timbouva Mart., as culicide, 145
Entomological course for students of malariology (book review), 303
Entopolypoides macaci, new blood parasite of monkey, 226
Eosinophilia (book review), 839
Epidemic dropsy, *see* Dropsy, epidemic
Epidemics, Some Notable, (book review), 150
Epidermophytosis
in Hong Kong, 185
South Africa, 185
a Spaniard, 184
treatment, 185
Epilepsy in cysticercosis, 631
Eratyrus cuspidatus naturally infected with *Tryp. cruzi* in Panama, 38
Eriocheir japonicus, paragonimus cysts in, 252
Eye diseases, see also Ophthalmology, tropical, *and under names of diseases of eyes.*
of childhood in S. India, 477
in Egypt, 477, 899
North Togoland, 476

Fasciola gigantica antigen for diagnosis of schistosomiasis, 250
hepatica disease, 629
treatment,
emetine and emetine hydrochloride, 628
magdala rose, 250
" Fièvre rouge " in Guadeloupe, 171
" Fièvre rouge congolaise," 875, 881
Filaria,
bancrofti [*Wuchereria bancrofti*]
invading eye, 274, 474, 475
microfilaria, in Chinese prisoners, Kiangsu, 270
periodicity of embryos, 274
possible vectors in Bahia, Brazil, 648
susceptibility to, of *Culex pipiens* and *C. fatigans*, 646, 647
malayi
antigen reactions, 271
mosquito vectors in Huchow, China, 647
mosquito vector in Java, 270, 271
ozzardi, in British Guiana, 647
Filarial affections of male genitalia, 271
orchitis, 273
and streptococcal septicaemia, 272
lymphangitis, 271, 273
considered as mild erysipelas associated with B. haemolytic streptococcus, 271
treatment by animal charcoal intravenously, 649
periodicity, 274, 277
Filariasis, 269–278, 646–649
in British Guiana, 647
Calcutta City, 515
Ceylon, survey of Southern Province, 269
Chinese prisoners, Kiangsu, 270
Java, 270, 271
case report, 270
histology, 620
ocular, 274, 474, 475, 652
treatment, with malaria and gold, 648, 649
Filariids in opossum
destruction of microfilariae by the omentum, 278
longevity of microfilariae in circulation of, 649
Fleas on rats, India, 844, *see also under genera, e.g., Xenopsylla*
Flies, control in Nairobi, 910
rôle in epidemiology of helminthic infestations, 232
rôle in spread of coccidiosis, 660
Food poisoning, bacterial, treatment with kaolin, 72
" Foreami " activities in Belgian Congo, 1933, 501, 503
sleeping sickness campaign of, 682
Fouadin, antimony dermatitis from, treated with sodium thiosulphate, 236
hepatic damage after, 235
Gambusia holbrooki, biology in Morocco, 819
Gangosa, 51, 56
Giardia intestinalis, anomalies of cysts, 197
Giardiasis,
biliary, 657
in children in Bern, 197
Giardiasis—*cont.*
enteritis, giardial, and amoebic dysentery, 197
treatment,
neosalvarsan, 197, 658
resin of *Schinus terebenthifolius*, 658
stovarsol, 197
Gilchristia dermatitidis, characters of, 181
Gillan's odema, 526
Glaucoma, sclerocorneal trephining for, 898
Glossina
classification, 722
climate and ; laboratory studies, 369
concentrations of, in Tanganyika, 368
control
by bush clearing, 39
Harris traps, 369, 724
by protection of vegetation from grass fires, 368
in Tanganyika Territory, 367, 368
identification of Nigerian species, 723
infectivity of relapse strains of *Tryp. rhodesiense* to, after Bayer 205 treatment, 30
larvae, behaviour before pupation, 41
in Masai Reserve, Kenya, 367
research on, program of Conference at Entebbe 1933, 12, 13
transmissibility by, of laboratory strains of trypanosomes, 31, 32
transmission experiments, need for efficient control, 10
in Uganda, 674
Glossina longipalpis, bionomics in Gold Coast, 40
morsitans
cyclical development of *Tryp. evansi* in, 362
heavy salivary gland infection with *Tryp. rhodesiense* from reedbuck, 709
morsitans submorsitans,
climate and, 369, 723
control, 40
larvae, behaviour before pupation, 41
longevity, effect of high temperatures on, 369, 723
palpalis
control, by bush clearing, 39
Harris trap, 369, 724
systematics of group, 722
tachinoides
climate and, 369, 723
control by bush clearing, 39
larvae, behaviour before pupation, 41
longevity, effect of high temperatures on, 369, 723
Gnathostoma spinigerum
in Japanese mink, 620
life history, 620
Gongylonema pulchrum infection of man, 646
Gonorrhoea in relation to conjunctivitis, 509
Gorgas Memorial Laboratory, 512
Goundou
in Jamaica, 51
Malaya, 527
Martinique, 892
Gout in Malaya, 527
Haemoglobinuria, *see under* Blackwater fever
Haemoproteus paddae, alleged schizogony of gametocytes, 659

Haiti, diseases in rural population, 62
Hamburg Tropical Institute, 515
Haverhill fever following rat bite, 906
Health unit system in rural areas, Mauritius, 64
HEAT STROKE, 494–496
Heat Stroke in California, Boulder Dam, 494
in Kansas, deaths in 1934, analysed, 495
in Shanghai, 37 cases analysed, 496
in soldiers, 185 " effects of heat " case sheets analysed, 494
prevention
at Boulder Dam, California, 494
at Witwatersrand mines, heat chamber tests, 494
treatment by saline injections, 494
HELMINTHIASIS, 229–279, 619–656, *see also names of diseases, e.g.,* Ascariasis
Helminthiasis
bibliography for 1933 (book review), 759
diagnosis, methods of egg detection, 229, 621
epidemiology,
rôle of flies in, 232
rôle of sewage farms in, 232
titles of unnoticed papers, 279, 655
treatment, principles and theories of, 229, 233, *see also* Anthelmintics
Helminths, *see also names of parasites, e.g.,* Ascaris
appendicitis and, 230, 244, 634
chemotherapy of, trial experiments, 236, *see also* Anthelmintics
immunity to, experiments on, 634
incidence
in Argentina, 512
in China, 619, 620
cats, 620
dogs, 620
school children, 619
in Egypt, 233
in France,
Provence, in children, 231
Toulon, in Senegalese troops, 231
in Indo-China, 620
in Italy,
Milan, in children, 657
in Manchoukuo, 657
in U.S.A., 229
Mississippi, 230
physiology of, with reference to control, 634
Hermetia illucens causing intestinal myiasis, 668
Heterodera radicicola eggs in human faeces, 646
Hippelates, transmission of yaws by, 884, 886
pallipes, digestive mechanism, 886
duration of motility of yaws spirochaetes in, 886
Histoplasma capsulatum [*Posadasia capsulata* (Darling) Moore, n. comb.]
cultivation, 219
infecting reticulo-endothelial system, 219
systematic position, 219, 905
Histoplasmosis due to *Posadasia pyriformis* and *P. capsulata,* 218
in infant in Tennessee, 219
Hong Kong foot, 185
Hookworm,
cultivation of larvae, 642
Hookworm—*cont.*
development, direct, of *A. caninum* after oral infection, 265
of *N. americanus* in guineapig, 265
longevity, 258
migration of larvae in proper and improper hosts, 266
rate of loss of, in man, 258
viability, 258, 620
Hookworm disease
in Corrientes, Argentina, 637
Egypt, 233, 527
India, survey of Ambala, Punjab, 638
Italy,
Florence, 638
Messina, 265
Jamaica, 637
Spain, 639
anaemia in, 259, 260, 262, 263, 527, 640
iron deficiency as factor, 262, 263, 640
nature and cause, 259, 260
blood in,
picture in *A. caninum* infection, 641
red-cell sedimentation, resistance, and coagulation time, 267
control,
drainage, 643
in Jamaica, 637
diagnosis
Stoll technique compared with simple smear method, 258
diet in relation to susceptibility of dogs to infection, 641
pregnancy and, 639
treatment, 229
appraisement of drugs, 643
acriflavine, 247
carbon tetrachloride, 644
chenopodium oil, 231, 644
6-hexyl-meta-cresol, 635
hexylresorcinol, 229, 234, 644
iron, 261, 263, 640
ortho-hexyl-phenol, 635
tetrachlorethylene, 229, 232, 644
thymol, 231, 644
Hormodendron algeriensis n. sp., 530
" Hot weather ear " in India, 73
House diseases in the topics, 514
Houses in tropics, screen cloth (wire gauze) for, 910
Hydatid cyst operation, formolage in, 631
disease
in China, 619
Minnesota, moose and timber wolves as reservoirs, 255
Morocco, 631
New Zealand, 254
fluid, chemical composition of, 632
culture of scolices in, 632 (fig.)
Hymenolepis diminuta,
eggs of, form and resistance, 254
resistance of rats to re-infestation by, 253
nana
in Formosa, age distribution, 634
Mississippi, 230
Poona, 254
Indian indigenous remedies, 528

Infectious diseases, experimental bacteriology in its application to (book review), 75
Insecticides,
sulphur compounds as, 663
volatility and boiling points of, 662
Isospora belli infection in man, 221
hominis infection in man, 660
Jacaranda decurrens in treatment of intestinal protozoa, 657
Japanese river fever, *see under* Typhus, Tsutsugamushi disease
Juxta articular nodules
in Euphrates Arabs, 891
Jamaica, 51
Panama, 894
Vienna, 891
Kahn test in leprosy, 547, 867
KALA AZAR, 81–92, 479–493, *see* Leishmaniasis
Keratitis, interstitial, and yaws, 891
Kerato conjunctivitis in Calcutta, 895
Keratomalacia in children in S. India, 477
in Manchuria, 473
Klebsiella rhinoscleromatis, 521
Lacewing-fly larvae, skin reaction to, 666
Latrines, pit, fly-control in, 911
Latrodectus mactans
bite, diagnosis and treatment, 673, 915
control, 914
tredecimguttatus, symptoms of bite, 673
Leishmania,
cultivation,
in haemoglobin-free media, 87
maintenance of strains in culture, 480, 485
on wetted N.N.N. medium, 87, 484
multiplication by shizogony ? 485
in nasal and oral secretions, 479
plant reservoirs, so-called, of, 90
possible lysis after somatic death, 482
transmission experiments with non-biting haematophagous flies, 69
Leishmania donovani
cultivation
on embryonic chick tissue, 91
on milk media, 484
flagellation in hamster blood, 87
transmission experiments with *Musca spectanda*, 909
infantum
comparison of Maltese and Catanian strains, 488
cultivation on wetted N.N.N. medium, 484
tarentolae, 489
development in *Phlebotomus minutus*, 486
tropica, guineapig susceptible to, 486
Leishmaniasis,
American, *see* muco-cutaneous
canine,
in Greece, 82, 88
India, 491
Rumania, 490
Spain, Salamanca, 88
Turkestan, 482
diagnosis, 86, 88, 491
oriental sore-like lesions in, 88, 491
serological reactions, 491
not transmitted to offspring, 88
Leishmaniasis—*cont.*
canine—*cont.*
studies on, 487
treatment by antimony lighting up skin lesions, 490
cutaneous leishmaniasis in Costa Rica, 489
of lupoid variety, 493
treatment with arsenic-antimony compounds, 489
kala azar
in Argentina, 481
Armenia, 89, 91
Brazil, 481, 482
China, 82, 483, 492
France, Paris, 492
Greece, 82
Italy,
Apulia, 90, 91, 480
Catania (book review), 534
Rome, 481
Sardinia, 493
Kenya, priority of report, 83
Manchukuo, 481, 510
Mediterranean regions, 81, 90, 91, 480, 487
Morocco, in child, 492
Spain, in children, 83
Tunis, 480
Turkestan, in children, 482
U.S.A., in children, 493
Yugoslavia, 81
agranulocytosis in, 482, 483
action of urea stibamine and neostibosan in relation to, 483
blood in,
reticulocyte count, 789
sedimentation rate, 485
cancrum oris in, 83
diagnosis,
blood film examination, 83
serum reactions
acid gelification, 86
in relation to animal species, 491
Chopra's antimony test, 86
formol-antimony test, 85, 86
formol-gel test, 85, 86
peptonate of iron test, 86
eventful case of, 484
hamster, European, susceptibility to Chinese virus, 486
histopathology of spleen and liver in, 84
infantile
associated with boutonneuse fever, 480
histopathology of, 84, 85
in Southern Italy, 91
in Spain, 83
in Turkestan, 482
leishmanoid, dermal, 490
of annular type, 84
Mediterranean, studies on, 81, 487
noma in children in, 483
phlebotomi of Greece and foci of, 82
plant reservoirs, so-called, of, 90
reticulo-endothelial system in, 479
skin lesions in child, 84
pigmentation in child in S. Italy, 91
symptoms,
enlarged epitrochlear glands, 493
titles of unnoticed papers, 92, 493

Leishmaniasis—*cont.*
kala azar—*cont.*
transmission,
dog tick suspected in Marseilles district, 480
in Mediterranean area, 90
by oral and nasal secretion, 479
by *Phlebotomus perniciosus*, 487, 488
treatment,
neostibosan, 483
urea stibamine, 484
in villages in China, 82
ulceration, general, in, 84
peri-anal, complicating, 83
muco-cutaneous (espundia),
allergy in, 90
histology, 90
nomenclature, 90
oriental sore
in Egypt, 81, 89
Italy,
Abruzzo, 91
Apulia, 480
Pesaro, 92
Rome, 481
Mediterranean, Eastern, 89
Palestine, 89
plant reservoirs, so-called, of, 90
reticulo-endothelial system in, 479
transmission in Mediterranean area, 90
treatment by
vaccine and berberine, 489
X-rays, 92
LEPROSY, 328–329, 535–555, 854–873, *see also Mycobacterium leprae*
in Angola, 538
Argentine, 861
Basutoland, 539
Bechuanaland, 539
Brazil, 331, 856
British Guiana, 328
British West Indies, 537, 854
Celebes, among the Sa'dan-Toradjas, 857
China, 334, 858, 860
Cuba, 855
French Sudan, 538
Great Britain, 541
Hawaii, 335, 541
India, 856
Bengal village, 539
Madras, 540, 854
Japan, 540
Korea, 540, 858
Leeward Islands, 551, 854
Manchuria, 333
Nauru, 330
Norway, 537
Philippines, 334, 857, 862
Spain, 855
Spanish Morocco, 539
Southern Rhodesia, 545
Swaziland, 539
Uganda, 331
Union of South Africa, 332, 333 (map), 859
United States of America, 331, 536, 854
Windward Islands, 854

Leprosy,
acido-resistant bacillus from leproma, 552
aetiology, 535
invisible virus hypothesis, 865
vitamin B_2 (G) deficiency as factor in, 335
and ainhum, resemblance, 862
allergic erythematous eruptions in, 551
allergy, specific, 338, 856
alopecia in, 536, 544
anhydrosis in, 536
atmospheric changes and lepra reaction, 867
bacillaemia in, 337
blood in, 336
cholesterol, 552
eosinophiles, 551, 866
lipase, 866
British Empire Leprosy Relief Association report 1934 (book review), 603
chaulmoogrates, emetic action of, 343
irritant constituent of, 343
possible disadvantage of refining, 548
Sapucainha oil from *Carpotroche brasiliensis*, 549
toxicity of ethyl esters, 548
in children of leprous parents, 334, 544, 862
early lesions, 543, 862
clinical records, case progress chart for, 544
control, 334, 538, 861
in Argentine, 861
Anglo-Egyptian Sudan, 538
French Colonies, 329
curability, 328, 537
dental studies in, 542
pyorrhoea, 863
diagnosis,
Bargehr's lepromine reaction, 341, 543, 856
complement fixation tests, 551, 552, 867
with actinomycetes extract, 339
of Gomez, 341
of Ota and Ishibashi, 551
with tubercle antigen, 867
dextrose tolerance test, 337
formol-gel test, 340
Herxheimer's reaction, 551
histamine test, 335, 858
Kahn test, 547, 867
McClure-Aldrich wheal test, 551
Mitsuda's reaction, 341
serofloccculation tests,
lipoid antigens in, 340
Rubino's, 340, 867
Vernes, 340, 547
trypanblue wheal test, 340
van den Bergh's reaction, 552
Wassermann reaction, 339, 547, 867
diagnosis, differential
from dermal leishmanoid, 490
syphilis, 552, 867
tuberculous skin lesions, 335
epidemiology, 538
of family leprosy in Minas Geraes, 856
leprolin cuti-reaction in relation to, 543, 856
susceptibility of young persons, 543
finger print changes in, 862
Herxheimer's reaction, 551
immunization by Bargehr's lepromine injections, 543, 856

Leprosy—*cont.*
incubation period, minimum, 543
Kahn test in, 547, 867
Leprosy Review, Oct. 1934, Jan., Apr., July 1935, 328, 536, 854
marriage and sterilization of lepers, 858
nerve abscess in, 336
nerve and skin lesions, relationship, 542
and neurofibromatosis, 545
nodules on male genitalia, 545
opossum, supposed sensitivity to infection, 339, 860
paralysis, facial, early ocular sign in, 899
paralysis, general, of leprotic origin, 536
prognosis, 856
rat lepromas, action of methylene blue on, 546
rat leprosy,
action of radiation on, 553, 864
bacilluria in, 553
bacillus of, 553, 554, 864, *see also Mycobacterium leprae murium*
leucocyte formula in, 554
incubation, effect of diet deficiency on, 553, 863
inoculation of other rodents with, 347, 348
researches on, 863
rats, inoculation with human leprotic material, 339, 865
the reaction in, 872
atmospheric changes and, 867
Recklinghausen's neurofibroma and, 545
skin,
elastic tissue changes, 552
glycogen destruction, 866
immune regions, bacteriological study of, 535
temperature, 544
skin and nerve lesions, relationship, 542
smallpox vaccination and, 347
sterilization and marriage of lepers, 858
and syphilis, differentiation, 552, 867
G.P.I. of leprotic origin, 536
titles of unnoticed papers, 348, 554–555, 873
transmission,
rôle of muscids in, 909
treatment,
management of reactions, 536, 872
of neuritis in, by iodized Wightiana ethyl esters, 344, 547, 868
of nose, throat and eye lesions, 536
public health aspects, 860
in Southern Rhodesia, 545
in village clinics, China, 872
treatment by
aniline dyes, 347, 869
anthrax vaccine, 870
Bonney's blue solution, 346
brilliant green intravenously, 871
carbon-dioxide snow and gold, 347, 871
chaulmoogrates,
" alepol," 549
" chaulphosphate," 549
" esperol," intravenously, 872
H. anthelmintica or krabao soap, orally, 342
H. wightiana oil intradermally, 868
intravenously, 344
iodized antileprol, 869
Leprosy—*cont.*
treatment by—*cont.*
chaulmoogrates—*cont.*
morrhuate and hydnocarpate compared, 854
copper sulphate, 873
crisalbine, 870
Crotalus toxin, as analgesic, 871
distilled water intravenously, 550
eosin, 869
eosinosate of caesium, 546, 547
fixation abscess, and high fat diet, 872
fluorescin, 346, 347, 869
phthallic acid constituent, 346
gentian violet, 869
gold preparations, 347, 870, 871
Hansen's leprolin, 341, 542
lugol, 546
manganyl, 870
mercurochrome, 869
methylene blue, 344, 345, 346, 545, 546, 869, 871
albuminuria in, 547
furunculosis in, 545
negative results in negroes, 546
potassium teriodide, 547
resorcin, intravenously, 549
sodium thiosulphate, 536
tar sulphur powder, 873
Vaudremer's vaccine, 342
tuberculoid, changes in, 336, 861, 862
lepra reaction in, 336
with tuberculosis in Hawaii, 335
Wassermann reaction in, 339, 547, 867
Leptomonads of lizards, insects and euphorbias in relation to leishmaniasis, 90
LEPTOSPIROSIS, 600–602, *see also* Weil's disease
Lester Institute of Medical Research, Shanghai, 65
Leukoma, corneal grafting in, 473
Lice, monograph on, 913
Loa loa infection, skin conditions in, 278
Lucilia sericata, influence of humidity on egg, 666
larvae in treatment of osteomyelitis, 667
Lupus erythematosus in Philippines, 185
Lymphangitis, chronic, treatment by animal charcoal intravenously, 649
tropical, antistreptolysin in sera from, 74
Lymphostatic verrucosis and " mossy foot," 182
MALARIA, 93–148, 391–445, 725–754, 783–820, see also Anopheles; *Plasmodium*
Malaria
in Adriatic Islands, 736
Algeria, control, 99
El Golea Oasis, 397
Argentine, Misiones, 511
Armenia, 67
Belgian Congo, 783
Katanga, endemic index, 100
Leopoldville, control, 100
Borneo, North, racial extinction of Muruts, 733
Brazil, 126
Bulgaria, explanation of spring rise, 107, 116

Malaria—*cont.*
in Ceylon, 399, 732, 733, 820
China
Shanghai, 99
Egypt, 397, 398
Europe, in relation to *A. maculipennis* races, 809, 812
Federated Malay States, 138
French West Africa, 112
Greece, 440, 736, 806, 807
Holland, 104
India,
Bengal, 95, 435
Calcutta, 398, 515
Ganges delta, 95
Mysore State, 94, 399
Patna, 398
Sind, Lloyd barrage, 93, 399
Indo-China,
Laos, 401
Tonking, 400
Italy, 102, 103 (fig.), 404
Malaya, 725
Taiping, 96
Manchukuo, 510
Nyasaland, 395
Panama, 108, 512, 784
Persia, 99, 734
Philippine Islands, 97, 111, 401, 402
Rumania, 101
Spain, 751
Sumatra, 96
Tanganyika, 735
Transvaal, 394
Turkey, 785
Uganda, 735
Union of South Africa, 393, 395
United States of America, 105, 405, 735, 740
U.S.S.R., 111, 463, 734, 819
Yucatán, 101
amblyopia following quinine, 116, 476, 899
avian, 117–122, 409, 424–425, 435
blood,
electric charge of erythrocytes, 120
sporozoite behaviour in, 121
blood reservoir, function of, 795
duration of infection, 119
immunity,
acquired, in relation to quinine treatment, 117
of mosquitoes to infection, 121, 424
and premunition, 120
meteorology and relapse, 120, 795
susceptibility of races of *Culex pipiens* to infection, 121, 424
plasmodia, classification, 122
prophylactic use of atebrin, 435
reticulo-endothelial system in relation to treatment, 410
treatment,
acridine derivatives, 419, 420
atebrin, 419
" gamostatic " and " schizotropic " efficacy of drugs, 409
quinine, 415, 416
quinolines of high molecular weight, 117
ultra-violet rays and Salvarsan, 118

Malaria—*cont.*
and blackwater fever, 200, 822
blood in,
macrocytic picture, 423
pigment, 127, 422
protein fraction of sera during and after rigor, 789
reticulocyte count, 789
reticulocytes, susceptibility to infection, 423
blood examination, *see under* diagnosis
cerebral, 407, 408, 415
and cirrhosis of liver, 741
coma, histopathology of nervous system, 741
congenital, 125, 126, 408, 838
control, *see under* prophylaxis
diagnosis,
blood examination,
of badly made smears, 789
defibrinated blood-film concentration, 110
enrichment method, 788
methylene blue stain, 423
method of cleaning capillary tubes used for counting parasites, 788
preparations of ex-flagellating gametocytes and oökinetes, 127
thick drop method, 789
Henry's reaction, 129–132, 420–422, 732, 790–793
antigenic structure of melanin, 732
cholesterin in, 793
flocculation and " surflocculation," 130, 131, 420, 421, 791
nature and mechanism of, 130, 420
non-specific reactions, 132, 420, 790, 792
pigments for,
choroidal, 790–792
from hair, 129
intradermal reaction, 110
liver tissue examination post-mortem, 126
from undulant fever, 406
in drug addicts, syringe transmitted, 108, 109, 405
endemic, splenometric index in, 739
epidemiology, meteorological factors in, 395
eye changes in, among drug addicts, 108
haemoglobin and, 94
haemozoin, malarial, 127, 422
in infants, 735, 837
inoculated, *see* therapeutic malaria
Italian School of Malariology, teachings of, 741
latent, reactivation of, 406
liver function in, 408
melanin and malarial haemozoin, 422
mental symptoms in, 743
in monkeys, 116 122–125, 425, 797–800
blood picture, 124
immunity in, 800
latent infection revealed by splenectomy, 799
mixed infections, 123, 797
plasmodia of, 125, 425, 797, 798
reticulo-endothelial system in, 125, 832
spleen in, 125, 833

Malaria—*cont.*
in monkeys—*cont.*
transmission, attempted, to laboratory animals, 800
treatment, 116
atebrin, 418, 727, 728, 747, 748
plasmoquine, 418, 727, 728, 747, 748
quinine concentration in relation to parasite count, 787
oedema in, 743
parasite index higher than spleen index in Tapanoeli, Sumatra, 96
pernicious, in Georgia, 740
pigment, 127, 422
placental infections, 125, 126, 838
and pregnancy, 837
prognosis, 407
prophylaxis,
antimosquito measures, *see under Anopheles*
drug control,
mass treatment, 434, 784, 785, 786
combined with antimosquito measures, 141, 142, 400
drug control by
atebrin, 434, 784, 786
atebrin and plasmoquine in Assam tea gardens, 417
plasmocide, sterilization of gamete carriers, 114, 434
plasmoquine, in Sudan, 143
quinoplasmine, 432
quinine, 142, 143, 400
mathematical study, 139
personal, regulations for individuals in malarious countries, 783
on rubber estates, 142, 143, 400, 728
on tea estates, 141, 417
quinine amblyopia, 116, 476, 899
vasodilatory action of, 444
serum, chemistry of, 131
lipase in, 128
spleen rupture in acute attack, 743
splenic index, 109, 402, 739
splenomegaly in benign tertian, 738
statistical analysis of field data, 739
subtertian, enumeration of parasites in untreated cases, 424
treatment of relapse in, 111
tertian, benign,
heterologous tolerance, 404
inoculation and onset, 405
natural refractoriness in a Caucasian, 738
numerical study of parasites in untreated cases, 424
splenomegaly in, 738
therapeutic malaria,
blood and mosquito inoculation compared, 426
inoculation of quartan parasite, 128
normal fever curve in, 427 (fig.)
parasitologic study, 427
titles of unnoticed papers, 146–148, 444–445, 752–754, 820
transmission, *see Anopheles*
by inoculation of filtered blood and C.S.F., 794
by syringe among drug addicts, 108, 109, 405

Malaria—*cont.*
treatment (book review), 79
in children and infants, 502, 742, 751, 839
drugs, anti-malarial, articles on, 385–390, 391
in Spain, 751
treatment by
acridine derivatives, 389, 420
adrenalin, 418, 747
atebrin, 110, 111, 112, 113, 393, 417, 420, 727, 728, 747, 748, 786, 787
circulatory depressant, 418, 727, 728, 747, 748
detection in urine, 749
direct effect on parasites, 110
intramuscularly, 113
liver and kidney function after, 747
pigmentation in, 747
psychoses following, 393, 417
atebrin musonate intramuscularly, 746
cinchona febrifuge, 115
Fourneau 574, 113
malarcan, 113
plasmocide, 114, 434
plasmoquine, 392, 418, 419, 420, 727, 728, 745, 747, 748, 749, 786, 787
circulatory depressant, 418, 727, 728, 747, 748
poisoning, 419, 749
plasmoquine and atebrin (APA), 745
quinacrine *see* atebrin
quinine, 116, 412, 413, 414, 416, 418, 444, 727, 728, 744, 747, 748, 749, 750, 786, 787
blood concentration after injections, 412
detection in urine, 416
elimination by bile, 444
field experiment, 116
intramuscularly, 412, 413, 414
intravenously, 412, 413, 414, 418, 727, 728, 747, 748
permeability of "central nervous barrier" to, 414
quinine and atebrin in preventing recrudescence, 744
quinoline derivatives, 113, 388, 420
with quiniostovarsol, 113
sodium cacodylate, 750
totaquina, 114, 410, 411, 415, 728, 749, 750
totaquina and quinine, relative efficacy, 749, 750
urotropine, in cerebral forms, 415
tuberculosis and, 70
war, sequelae of, 406, 740, 903
Wassermann reaction in, 794
Manchurian plague prevention service, memorial volume, 1912–1932 (book review), 152
Medical studies
of Annexe of Laghouat, Algeria, 507
Haiti, 62
Java, 508
Mzab, Algeria, 62
some South Sea Islands, 509
Medical training
of Africans, 500
hygiene background needed, 513

Melioidosis, 525
Methylene blue, toxic symptoms, 216
Microbes as modified by change of vector, 531
Millet fever in Niamey (Niger) district, 901
MISCELLANEOUS, 60–74, 215–228, 500–533, 657–675, 900–915
Miscellaneous, titles of unnoticed papers, 227–228, 532–533, 674–675, 915
Mongoose, resistance to snake venoms, 376
Monilia genus, 530
Moniliasis, complement fixation in, 185
intradermic reactions in, 185
Monkeys, *see also* Malaria in monkeys
Entopolypoides macaci n.g. et sp., a new blood parasite of, 226
Trichomonas hominis inoculated into vagina of, 224, 658
Mortality rates of estate labourers, Sumatra, 508
Mosquitoes, *see also under diseases transmitted by,* e.g. Malaria; Yellow fever, *and under genera,* e.g. *Aëdes*; *Anopheles*
of Australia, check list, 660
China,
Hangchow, 661
Shanghai, control, 99
Turkmenistan, Karakala region, 802
Uganda, Namanve swamp, 661
U.S.S.R., Kola Peninsula, 906
control,
automatic tide gates for salt-marsh breeding places, 662
Enterolobium timbouva Mart. in, 145
prickly pear emulsion in, 662
screen cloth (netting) for tropics, 146, 910
eggs, effect of bacteria on hatching, 134
flight distances, 105, 107, 108
instructions for collecting, 441
larvae, nutrition as affecting biology of adults, 664
nutritional needs of, 912
perispiracular glands of, 912
technique of mounting, 664
maintenance in laboratories, 663
" Mossy foot " and lymphostatic verrucosis, 182
Musca domestica, myiasis of urethra, 666
spectanda, potential transmitter of protozoa and spirochaetes in Nyasaland, 68
Mycetoma in Algiers, 182
in Brazil, 182
Mycobacterium leprae, see also Leprosy
in blood from normal-looking skin, 337
cultivation, 338, 550, 552, 864, 865
intracellular granular phase, 859
methylene blue, action on, 546
fixation by, 871
morphology, 338, 550
in tissues of " arrested " cases, 535
var. *album,* 338
var. *aurantiacum,* 338
Mycobacterium leprae murium, see also Leprosy, in rats
cultivation, 864
and " Duval's Bacillus 514," 863
in genital glands, 864
methylene blue, action on, 553
resistance to ultra-violet ray, 553, 864
Mycobacterium leprae murium—cont.
survival in glycerine broth, pH influence on, 553
in guineapigs, 553
ultravirus stage, 554
tuberculosis, from leprous nodule, 338
Mycosis (es) *see* Actinomycosis, Blastomycosis, etc., and under organisms producing mycoses, e.g., *Monilia*
Mycosis of bone due to *Acremoniella rugulosa,* 218
of eye, 898
Myiasis, in Egypt, 911
due to *Cochliomyia* in tropical America, 665
due to *Dermatobia hominis* in Panama, 667
of wounds, treatment, 665
cutaneous, in infants, due to *Wohlfahrtia,* 665
intestinal, due to *Chrysomyia putoria,* 668
due to *Hermetia illucens,* 668
urethral, due to *Musca domestica,* 666
Myoglobinuria of cattle, 821
Myositis, suppurative, in Cochin-China, 524
Myriapod, bite of, 672
Naga sore on tea estates, India, 216
Necator americanus, development in guineapigs, 265, *see also* Hookworm disease
longevity and rate of loss in man, 258
Nematode larvae, detection in cyclops, 653, 654
Nematodes, as parasites of *Anopheles,* 256
physiology in relation to control, 634
Neocellia fuliginosa, zoophilism, 493
Neotoma fuscipes macrotis carrying *T. cruzi* in California, 364, 365
Neurofibromatosis and leprosy, 545
Nippostrongylus muris resistance in rats, 269
Nomenclature of Disease (book review), 463
Nyctinomus macrotis, Tryp. cruzi in, 717
Oedema, Gillan's, 526
in Kikuyu children and adults, 71
post-dysenteric, in children, 773
treatment with pineapple juice, 71
Onchocerca nodules, *caecutiens* and *volvulus,* histology, 649
volvulus associated with retino-choroiditis, 650, 652
Onchocerciasis, central American form (book review), 300
in A. E. Sudan, 650
Egypt, ocular, 475
Kenya, 652
on Ivory Coast, ocular, 899
Oncomelania, intermediary of *S. japonicum,* biology, 247
nosophora, effect of liming on, 627
OPHTHALMOLOGY, TROPICAL, 471–478, 895–899, *see also* Eye diseases, *and under names of diseases of eyes.*
Ophthalmomalacia, 478
Opisthorchis disease, treatment, 250, 252
felineus, biology, 251
distribution in East Prussia, 251, 252
Opossum, microfilariae of, 278, 649
Opuntia vulgaris, mosquito control by, 662
Ornithodorus canestrinii from Isfahan, Persia, 599
spp., attempts to transmit *Tryp. cruzi* by, 38
as vectors of relapsing fever, 310, 314
turicata, as vector of relapsing fever, 296, 314

Oroya fever, *see* Carrion's disease
Osteomalacia in China, subcapsular cataract in, 474
Osteomyelitis, maggots in treatment, 667
Pacific races, depopulation, 60
Paederus brasiliensis, dermatitis due to, 671
Paragonimiasis, abdominal involvement, 253
Paragonimus in China, life history, 619, 629
Potamon denticulatus as host, 619
viability and excystment, 629
Paragonimus westermanii
cysts in *Eriocheir japonicus*, 252
from dogs in Madras, 629
Paraplasma flavigenum of Seidelin, 227
Parasitology, place in medical curriculum in China, 903
Pasteurella pestis
carried over in susliks, 450
cultivation on bile nutrient medium, 452
differentiation from *Past. pseudotuberculosis rodentium*, 451
effect of freezing on, 451
Pediculus, anatomy and systematics, 913
Peiping Union Medical College; laboratory manual of bacteriology and immunology (book review), 676
PELLAGRA, 465–470
Pellagra
in Austria, sporadic cases, 468
China, in soldiers at Nanking, 466
Manchuria, three cases, 467
Rumania, 469
Sudan, in millet eaters, 465
aetiology, 465
rôle of gastro-intestinal tract, 215
alcoholism and, 467
canine black tongue, neuropathological changes in, 469
metabolic derangements in, 469
in millet-eaters in the Sudan, 465
and pernicious anaemia, relationship, 468
symptoms, 465
titles of unnoticed papers, 469
treatment with yeast, 468
Peromyscus spp., pathogenicity of *T. brucei* for, 35, 711
Phlebotomus (*i*)
of China, 913
Greece, in relation to kala azar foci, 82
detection by "tanglefoot," 908
identification of larvae, 88
minutus, development of *Leishmania tarentolae* in, 486
papatasii, hibernation in Palestine, 491
parroti var. *sardous* var. n., in Sardinia, 493
perniciosus, feeding experiments on Leishmania-infected animals, 487, 488
Piedra in Venezuela, 183
PLAGUE, 446–456, 841–853, *see also Pasteurella pestis*
Plague
in Angola, 844
S. America, on west coast, 848
Argentina, 447, 455
China, 841
French West Africa, 449
Plague—*cont.*
in Hawaiian Islands, 446
India, 841
Madras, 453
Mysore State, 844
Travancore State, 843
Kenya, 844
Madagascar, 449, 846, 847, 850
Malaya, Singapore, 450
Manchukuo, 844
Peru, 448
E. Siberia, 451
Spain, Barcelona in 1931, 307
Tunis, 846
Uganda, 844
U.S.A., California, 847
antiplague organization in E. Siberia, 451
Brachytarsomys albicauda infected with, 449
Ceratophyllus acutus, vector for ground squirrels in California, 848
Citellus pygmaeus, life-cycle, 849
leucocyte picture in hibernation, 849
climate and, 453, 846
cotton industry and, 845
diagnosis, 451, 452, 850
bile nutrient medium in, 452
on material sent from distance, 452
Dinopsyllus lypusus in Madagascar, 449, 847
flea transmission questioned, 456
fleas carried in jute cargoes to Peru, 449
of guineapigs as reservoirs in Andes, 849
of rats in India, identification key, 844
of rats, Los Angeles Harbour, 848
of rats, Philadelphia, 847
of susliks in relation to, 908
immunization studies, 454
lice as reservoirs in Andes, 849
Manchurian Plague Prevention Service, Memorial Volume, 1912–1932 (book review), 152
pneumonic, pathological anatomy, 852
ocular lesions in septicaemic, 851
in polecat, 451
prophylaxis, 447, 455, 850, 851
deratization, 455
vaccination, 850, 851
in rabbits and guineapigs following rat epizootic, 454
rat burrows, climatic conditions in, 453
cyanogas fumigation of, 453
rat examinations, systematic, at Rio, 448
Rattus alexandrinus in Tunis, 846
septicaemia with ocular lesions, 851
serum, anti-bacterial, concentration of, 852
thermo-precipitin test for, 454
susliks in relation to, 450, 847, 849
titles of unnoticed papers, 456, 853
unusual forms, 452
vaccination, 850, 851
with living plague virus (EV), 850
vaccines, comparative efficacy, 455, 851
in voles, 451
Xenopsylla brasiliensis, chief vector in Uganda, 674, 845
cheopis, biology in Madagascar, 846
index in Buenos Aires, 447
index in Hawaiian Islands, 446
hawaiiensis and rural plague in Hawaiian Islands, 446

Plasmodium (a) of birds, classification, 122
of monkeys, 122, 797
nuclear reaction in various stages of development, 794
Plasmodium brasilianum, effect of reversal of light and shade on sporulation time, 425
cathemerium, immunity in relation to quinine treatment, 117
periodic development of sexual forms, 118
strains with and without gametocytes, 119
size in relation to reproduction, 119
susceptibility of mosquitoes to, 425
cynomolgi, description, 122, 797
falciparum, binary fission, 109
in placenta, 126
gallinaceum n. sp. of fowl, 796
inui, associated with *P. knowlesi* in mixed infections, 123, 797, 798
knowlesi, associated with *P. inui* in mixed infections, 123, 797, 798
blood picture in infections with, 124
capsule formation in, 125
chemotherapeutic tests on, 116, 787, 788
description of, 797, 798 (table)
rôle of reticulo-endothelial system in infections with, 125
malariae, direct effect of atebrin on, 110
ovale, 109, 110
capsule formation in, 125
reported from East Africa, 110, 735
West Africa, 109
Western South America, 109
specific status, 737
paddae n. sp., of Java sparrow, 659, 796
praecox (*relictum*), sporozoite behaviour, 121, 795
immunity to, 120
relapses in relation to meteorology in infections with, 120
susceptibility of races of *Culex pipiens* to, 424
vaughani, cross-immunity tests with, 796
vivax, capsule formation in, 125
direct effect of atebrin on, 110
natural refractoriness in Caucasian to inoculation of, 738
nuclear division in, 794
P. ovale as modification of, 737
sporozoite behaviour, 405
Polyneuritis, alcoholic and other forms, rôle of gastro-intestinal tract, in 215
Population problems of Pacific races, 60
rural of Haiti, 62
Poradenolymphitis, *see* Climatic Bubo
Porocephalus armillatus infection in West African native, diagnosed in life, 672
Posadasia spp. causative organisms of histoplasmosis, 218
Protozoa,
action of immune serum produced in rabbits by injecting *Bodo*, 223
hyperparasitism in, 220
ciliate, enumeration method, 225
intestinal,
of birds, 221
Protozoa—*cont.*
intestinal—*cont.*
of children,
American Indians, Wyoming, 188
Córdoba, 904
Milan, 657
of chimpanzee, 220
cultivation,
gastric mucin as medium, 221
influence of starch, 659
quinanil as bactericide, 222
rôle of haemoglobin in blood media, 223
diagnosis
from purged stools, 220
statistical survey of chances of detection, 220
in Formosa, 187
in Japan, Kyûsû district, 187
of man and monkeys, 658
in Manchukuo, 509
in Misiones, Argentine, 512
in Philadelphia, 188
of pigs in Tennessee, 779
of rats, correlation with range of pH, 222
in Swedish mental hospital, 220
treatment by *Jacaranda decurrens*, 657
in Zacatecas, Mexico, 188
Pseudorabies of Aujeszky, 175, 176, 607
Quinine,
amblyopia, 116, 476, 899
elimination by bile, 444
self-poisoning with, in Bulgaria, 216
vasodilator action of, 418, 444
Quinanil as bactericide in isolation of insect flagellates, 222
RABIES, 173–180, 605–618
in Congo, 617
Germany, 178
India, 176
South Africa, 616
in animals, prophylactic vaccination by single dose administration, 179
vaccine protection test, 178
Borna's disease and, 618
clinical aspects of fatal cases, 180
diagnosis by mouse inoculation, 176, 608
immunity,
lowered resistance of animals sensitized by neurotoxin, 610
natural, of dog, 609
immunizing processes, comparison, 610
immunization, rabicidal power of serum after, 606
Negri bodies, demonstration of, 609
formation of, 173
structure, 174, 609
paralyses, post-vaccinal, 179, 617
pathology, 177, 609
histology in human brain, 177
intestinal changes in rabid rabbits, 609
irritability of intestinal sympathetic and parasympathetic nerve endings, 177
of lung, presence of virus in, 177
processes affecting haemato-encephalic barrier, 177

Rabies—*cont.*
pseudorabies of Aujeszky, route of infection, 175
in Rumania, 176
Spain, 608
serum, rabicidal power after immunization, 606
symptoms, 176, 608
paralytic, of Landry type, 179, 608, 617
transmission by vampire bat, 607
treatment, 178, 610
decentralization of, 618
experimental, in mice, 618
local sero-therapy in animals, 180
paralytic accidents following, 179, 617
selection of virus strains for, 608
statistics of,
Bandoeng, D.E.I., 612
Germany in 1933, 178
Pasteur Institute, Paris, in 1933, 178
virus
in corneal epithelium, 173
effect of low temperature on, 174
electrical charge of, 174
fixed, experiments on, 606
inactivation by quartz mercury vapour lamp, 607
by methylene blue, antigenic properties, 607
resistance to desiccation and glycerine reduced by passaging, 605
resistance to ether and dilution increased by passaging, 606
selection of strains for treatment, 606
transformation into "street," 605
in the lung, 177
in neurones of salivary glands, 605
"neuroprobasie," 607
of pseudorabies of Aujeszky, 175, 176, 607
resistance to ferments, 174
in sciatic nerve, 173
Rat bite followed by Haverhill fever, 906
followed by spirochaetal jaundice, 602
RAT-BITE FEVER, 599–600
in France, 600
Vizagapatam, 599
pathogenicity of *S. minus* to guineapigs, 599
scrotal reactions in guineapigs compared with those in typhus, 600.
Rats and their ectoparasites in relation to plague in Barcelona (book review), 307
Rattus alexandrinus and plague in Tunis, 846
"Red fever" of the Congo, and positive yellow fever protection tests, 875, 881
Reduviid bugs naturally infected with *Tryp. cruzi* in Panama, 38
RELAPSING FEVER, 296–299, 309–327, 596–599, *see also* Spirochaetes of Relapsing fever
in Africa, 310
America, 311
Asia, 310
California, 299, 311
Chitral, 296
Panama, 513
Relapsing Fever—*cont.*
in Russia, 310
Switzerland, Basle, 597
Texas, 296
Tunis, Spanish-African type, 297
animal reservoirs, 311
chemotherapy, 316, 596
critical review, 309–327
epidemiology, 309
immunity, 319
mixed infections, 322
pathology, 318
"pseudoinfection" in mice, 597
"pseudo spirochaete" from patient in Basle, 598
residual brain infections, 321
spirochaetes,
cultivation, 323
staining methods for, 324
therapeutic uses, 323
titles of unnoticed papers, 599
transmission, 296, 313, 599
bugs, rôle in, 297
Ornithodorus canestrinii from Persia, study of, 599
Ornithodorus turicata, 296
treatment, experimental, of rodents,
by arsenbraun, 701
arsengelb, 701
Retinitis pigmentosa, 899
Retrobulbar neuritis in Chinese, 476
REVIEWS AND NOTICES, 75–80, 149–152, 300–308, 463–464, 534, 603–604, 676, 755–760, 835–840, 916–918
Rheumatism and yaws in Ruanda-Urundi, 892
Rhinocladium beurmanni recovered from nodular sporotrichosis, 529
Rhinopharyngitis mutilans, 56
Rhinoscleroma on Bali Island, 73
in Sumatra, 521
diagnosis, complement fixation reaction, 522
Rhinosporidiosis in India, 526
Rhipicephalus sanguineus as vector of boutonneuse fever in Sicily, 575
vector of relapsing fever, 315
vector of typhus in Kenya, 574
Rice, vitamin B content, as influenced by Clayton disinfection, 5
as influenced by polishing and cooking, 4
Ringworm, *see* Tinea
Rockefeller Foundation, annual report 1933, 78
Rocky Mountain Fever, *see under* **TYPHUS GROUP OF FEVERS.**
San Domingo expedition of 1802, two MSS. by Chief Medical Officer, 69
Sandflies, automatic tidegates in control of, 662
Mediterranean, in relation to kala azar, 487
SANDFLY FEVER, 171–172
Sandfly fever in China, 913
on Indian frontier, laboratory investigations, 171
aetiology, 172
Sarcosporidia in myocardium of premature infant, 226
Schick test, positive results in natives, 875, 876
Schinus terebenthifolius resin in treatment of giardiasis, 658

Schistosoma bovis
Bulinus contortus, intermediary, in Tunis, 237
shape of ova, 240 (fig.)
haematobium infection
in Algeria, potential mollusc carriers, 243
in Cyrenaica, in children, 243, 623
focus at Djanet, Algerian Sahara, 623
foci in Madagascar, 624
in Sierra Leone, *Physopsis globosa* as intermediary, 237
shape of ova, 240 (fig.)
in Tunis, *Bulinus contortus* as intermediary, 243
incognitum, 247
intercalatam n. sp., from Stanleyville, Belgian Congo, 239, 242
shape of ova, 240 (fig.)
japonicum infection
diagnosis by hatching of miracidia, 627
intermediary in China, 247
intermediaries in Philippines, 246, 655
treatment, antimony, 628
in wild rats reduced by liming of *Oncomelania nosophora*, 627
mansoni infection
chylothorax caused by, 626
in Porto Rico, 244, 245, 625
in Ruanda-Urundi, 626
in Sierra Leone, *Planorbis pfeifferi* as intermediary, 237
surgical manifestations, 246
in the great omentum, 246
Schistosomes, cercariae, "tactile hairs" on, 239
in pigs in Madras, 247
Schistosomiasis,
Algerian Sahara, Djanet, 623
Belgian Congo, Katanga, 242
Stanleyville District, 239
Brazil, 126
Cyrenaica, in children, 243, 623
Egypt, 233, 244, 622
Madagascar, 624
Philippines, 246, 655
Porto Rico, 244, 245, 625
Sierra Leone, 237
Surinam, Dutch Guiana, 246
Tunis, 243
and appendicitis, 244
carcinomatous appendix and, 627
diagnosis,
liver tissue examination post-mortem, 126
skin reaction to antigen from *Fasciola gigantica*, 250
intermediaries
in Algeria, 243
South and West Africa, 237, 241
Egypt, bionomics of, 622
exclusion of *Physopsis* by running water through mesh, 623
treatment,
acriflavine, 241, 247
antimonials, 249, 624
action on liver, 248
fouadin, 248, 624
Sdt. 386 B, experimental, 250
ureter affected, 244
Schizotrypanum cruzi see Trypanosoma cruzi
Scolopendra cingulata venom, action on human skin, 672
Scorpion poison, action on man, 217
Screw worm fly, correct name of, 665
Simulium damnosum, trapping experiments in Uganda, 674
Sinusitis, chronic maxillary, in the tropics, 526
Skin of Africans, colour changes in, 185
SLEEPING SICKNESS, 8–43, 349–371, 677–724
Sleeping sickness *see under* Trypanosomiasis, human, African
SNAKES, VENOMOUS, AND SNAKE VENOMS, 372–384
"anavenoms" produced at S. African Institute for Medical Research, 67
antivenenes
concentration by ammonium sulphate method, 384
keeping properties, 217, 383
specificity of viperine, 382
Australian snakes, 374
bacterial flora of mouths, 374
venoms of, 374, 377
bites,
fatality rate in Switzerland, 382
mechanism, 373
treatment by antivenenes, 382
Crotalus adamanteus, enzymes and toxic principles of venoms of, 377
dentition, 372
of Indo-China, 372
mongoose resistance to venoms of *Naja naja atra* and *Bungarus multicinctus*, 376
poison fang, evolution of, 372
rattlesnake, anaphylaxis with dermatitis, 381
venom yield, 374
venoms,
anti-complementary action of, 376
antitoxic action of liver on, 381
effects on blood cells, 380
use in haemophilia, 380
effects on cardio-vascular system, 378
enzymes in, 377
haemorrhagin content, estimation of, 383
peripheral action of, 377
pharmacology of, 376
toxicity of Formosa crotaline, 375
uterine contraction caused by; effects of formaldehyde on, 381
Sodoku *see* **RAT-BITE FEVER**
South African Institute for Medical Research, report, 66
Spider, black widow (*Latrodectus mactans*), 914, 915
Karakurt, 673
Sydney funnel-web, 672
Spirochaeta cobayae, 598
duttoni
dissociation of functions of motility and reproduction by total rays of mercury lamp, 298
pertenuis
differentiation from *S. pallida* by animal inoculations, 57
transmission experiments with non-biting haematophagous flies, 69

Spirochaeta—cont.
usbekistanica infection,
influence on *Tryp. brucei* infection in guineapigs, 298, 323
Spirochaetes,
action of chemotherapeutic agents on, 596
effect of radiation on reproductive capacity, 298
electrophoresis of, 222
of relapsing fever,
cultivation, 323
staining methods, 324
Spirochaetosis, fowl
chemotherapy, 297
immunity in newly-born animals, 297
Spirillum minus
influence on *Tryp. brucei* infection, 298
pathogenicity to guineapigs, 599
scrotal reactions in guineapigs, 600
Sporotrichosis in Algeria, 529
Sporotrichum biparasiticum, 529
SPRUE, 44–49
anaemia, pathology of bone marrow in, 46
caecum perforation in, 45
in child from Ceylon, 45
intestinal canal, anatomy, 46
non-tropical
an endocrine disease or an avitaminosis ? 49
in Denmark, 49
in New Jersey, 44
in Sweden, 44
titles of unnoticed papers, 49
treatment, 47
A.T. 10 for tetany, 48
liver extract, 48
Steatorrhoea, idiopathic, 49
Sternal puncture, 530
Stomoxys and trypanosome transmission, 11, 33
Stomoxys calcitrans, experimental transmission of yellow fever virus by, 294
Streptococcal dermatitis, treatment, 185
Streptococcal septicaemia and filarial orchitis, 272
Strongyles in man in Katanga, determination from size of eggs, 645
Strongyloides, fecundity of females of parasitic generation, 267
Sudan blindness and *Onchocerca volvulus*, 650
SYPHILIS AND YAWS, 50–59, 883–894
Syphilis
in French Cameroon, 54
Panama, 894
S. Sudan, 53
Tripolitania, 58
differentiation from leprosy, 552, 867
and yaws, relationship, 57, 884, 890
Tabes and climatic bubo, 499
Taenia saginata antigen, 633
and appendicitis, 231
eosinophilia, 634
treatment with hexylresorcinol, 235
transduodenal, 634
Taenia solium, epilepsy and, 631
Taenia taeniaeformis, immunity against, transmitted to offspring, 634
Tapeworm antigens, serological investigations of, 633
infestation and appendicitis, 634
Threadworms, treatment with hexylresorcinol, 235
Three-day fever in Madagascar port, 905
Tick-borne diseases in U.S.A., 517
Ticks of Daghestan, Caucasia, 909
of rodents in Kenya, 574
Tinea circinata in Chinese boy, laboratory findings, 184
imbricata in Bengal, causative agent, 184
tonsurans, in Schleswig-Holstein, treatment, 184
in Spanish Morocco, 183
Trachoma, 471–473, 895–897
in British Colonial Empire, 471
Egypt, 477
Glasgow, 895
India, 895, 896
Poland, in children in Cracow, 472
Tunis, 473
aetiology, 477
follicle formation, 897
Herbert's pits, 472, 896
lysozyme content of tears in, 473
pannus, intracorneal injection of mercury cyanide in, 472
prophylaxis, during infancy, 473
and pterygium, 473, 896
ptosis in, 472, 895
treatment,
formol, 896
ginger, 473
high frequency fulguration, 897
mercury cyanide, 472
taurocholate of soda, 897
yatren, 473
virus, introduced by bacteria, 897
isolation of, 895
Training of African medical personnel, 500
Trematode infections, skin allergy and complement fixation in, 629
Triatoma spp. infected with *Tryp. cruzi* in Venezuela, 38
platensis in Mendoza Province, Argentine, 717
protracta infected with *Tryp. cruzi*, in California, 364, 365
rubrofasciata, symptoms of bite, 671
Trichinella, in animals, effect of secondary infections on eosinophilia, 268
calcified, in bear's flesh, 269
in man, in the Argentine, 269
prenatal infection in guineapig, 645
in rats, action of causyth on, 646
spiralis, antigen, specificity, 268
immunization of rats against, 645
virulence in experimental host, 268
Trichomonads from fowls and rats, elimination and cross-infection experiments with, 659
of man and macaques, 658
Trichomonas enteritis and amoebic dysentery, 197
hominis, 658, 659
attempted infection of monkey's vagina, 224
passage alive through stomach and gut of monkey, 223
vaginalis, cultivation, 659

Trichuris trichiura, and appendicitis, 231
eggs of, in fly droppings, 233
incidence in Mississippi, 230
in Philippines, 635
treatment,
6-hexyl-meta-cresol, 635
hexylresorcinol, 235
ortho-heptylphenol, 635
Tropical diseases [Hegler & Nauck] (book review), 77
treatment and prophylaxis [van Nitsen] (book review), 305
Tropical medicine [Rogers & Megaw] (book review), 151
background of hygiene training needed in, 513
lectures on [Fróes] (book review), 603
in United States of America, 64
New York City, 513
Tropical ulcers, *see* Ulcers, tropical
Tropics, acclimatization of white races in, 65, 510, 511
rural health unit system in, 64
Trypanosoma brucei
germanin-fast strains, rapid production of, 703
infection by,
influence on, of avitaminosis, 36
influence on, of mixed infections with spirochaetes, 298, 323
infectivity of blood of rats after massive subcutaneous injections of, 711
infectivity to man, 688, 689
in mice, synergic action of arsenic and antimony on infection, 708
in *Peromyscus*, maintenance of laboratory strains, 711
pathogenicity, 35, 711
in rats, relation of spleen and liver weights to infection, 712
transmission, to cats by feeding on infected carcases of rats, 33, 352
experiments with non-biting haematophagous flies, 69
of old laboratory strains by Glossina, 31
of recently isolated strains by direct passage from vertebrate to vertebrate, 33, 352
variations in drug susceptibility with change in virulence, 705
congolense
cultivation, 34
infectivity of blood of infected mice after treatment, 354
of blood of rats after massive subcutaneous injection of, 711
in mice, effect of splenectomy, 30
in rats, relation of spleen and liver weight to infection, 712
re-infection and immunity in guineapigs, 713
transmission to guineapigs by inoculation, 353
treatment by,
orsanine, 354
tryparsamide (tryponarsyl), 354, 355
tryponurile, 355
urotropine with tryparsamide, 355, 695
Trypanosoma—cont.
cruzi
in armadillo (*Zoëdyus* sp.) in Mendoza, Argentine, 717
in bats, Jujuy, 717
in cat, Jujuy, 37
cultivation of, 34, 721
development in *Melophagus ovinus*, 716
dogs as hosts, 37, 77, 719
in man, duration of infection, 363
passage through intact conjunctiva, 363
in monkeys from Java, 718
nomenclature, correct, 722
reduviid bugs naturally infected with, 38
transmission, experimental, to man, 37, 364, 721
by Ornithodorus spp., negative, 38
ulceration in dogs and armadillos infected with, 366
virulence attenuated by human passage, 37
wood rats as natural carriers in, California, 364, 365
duttoni
multiplication forms in fatal mouse infections, 42
equiperdum
glucoside metabolism of, 42
protective action of copper against infection with, 362
thermoprecipitation reaction in infection with, 362
evansi
cyclical development in *G. morsitans*, 362
dissociation of functions of motility and reproduction by total rays of mercury lamp, 298
gambiense
cultivation, 34
exaltation of virulence of strain in guineapigs, 42
infectivity to man, 688
laboratory contracted infection with, 69
transmission, hereditary, in man, 16
of old laboratory strains by *Glossina*, 3
hippicum
infection in Panama, 512
lewisi
development in *Melophagus ovinus*, 71
infection in rats, chemotherapy, 708
influence of splenectomy on, 42
mechanism of drug action, 29, 703, 70
protective action of copper and iron, 4
platydactyli
transmission by sandflies, 489
rabinowitchi
cultivation, 43
rhodesiense
action on, of Bayer 205, in tsetse infection of rats, 363
in antelope, behaviour, 11, 690
cerebrospinal fluid examinations, 33
francolin as reservoir, 710
guinea-fowl as reservoir, 710
infectivity to man, 680, 688
effect of guineapig passage on, 689
infectivity to tsetse in relapse after Bayer 205 treatment, 30

Trapanosoma rhodesiense—cont.
transmission,
to man, through antelope and *G. morsitans*, 352
of old laboratory strains by *Glossina*, 31
of recently isolated strains by direct passage from vertebrate to vertebrate, 33, 352
to white rats, by feeding on infected carcases, 352
by inoculation, 353
Trypanosome(s)
chemotherapeutic agents, mode of action on, 355, 358, 596
classification, 724
cultivation, 34, 43
in haemoglobin-free media, 87
drug-resistance in, 15, 17, 22, 358, 359, 684, 687, 695, 702, 703, 704
electrophoresis of, 222
reciprocal influence in mixed infections, 713
Trypanosomiasis *see also* Trypanosoma; Trypanosomes; Glossina; and Tsetse flies
animal,
bovine, in Nigeria, 686
equine, in Panama, 512
immunization, by protective inoculation, in Africa, 43, 714
research program of East African Conference, 12
transmission, direct, to ruminants by Stomoxys, 11
avitaminosis, influence on course of infection in rats, 36
human,
African (sleeping sickness)
in Belgian Congo, 502, 504
Foreami report (1933), 682
Cameroon, 14, 18
French West Africa, 684
Gold Coast, 40, 682
Nigeria, 16, 685
Southern Rhodesia, 685
Togoland, 15, 684
central nervous system, changes in, 349
morula cells of Mott, 350
control, *see also* prophylaxis
administrative measures, 678, 681
of tsetse flies, 39, 367, 368, 369, 678, 681, *see also Glossina*
development, cases of slow evolution, 349
diagnosis, 682
East African Governor's Conference, Research Conference 1933, 12
East Africa Sub-Committee of Tsetse Committee, Economic Advisory Council, Report, 677
Jarisch-Herxheimer reaction in, 350
laboratory contracted infection, 694
lumbar puncture in, 15, 683
ocular troubles due to treatment, 19
prophylaxis,
Bayer 205 in, 8, 9, 10, 28, 679, 681
experiments on volunteers, 8, 9, 10
in Cameroon, 14
Trypanosomiasis—*cont.*
human—*cont.*
African (sleeping sickness)—*cont.*
prophylaxis—*cont.*
copper and iron, in experimental infections in rats, 42, 362
nutrition in, importance of, 687
" styryl-245 " in, 29
psychosis in, 693
research program of East African Conference, 12
serum, human, trypanocidal action of, 360, 361
symptoms, extra-pyramidal syndrome, 693
titles of unnoticed papers, 43, 370, 724
transmission,
hereditary, 16
high rate of salivary gland infection noted in *G. morsitans*, 709
infectivity of polymorphic trypanosomes to man, 688, 690
by non-biting haematophagous flies, possibility discussed, 68
of *T. rhodesiense* through antelope and *G. morsitans* to man, 352
treatment (including experimental),
arsenbraun, tests on rodents, 701
arsengelb, tests on rodents, 701
arsenic and antimony, synergic action, 706, 708
arsenicals, aromatic, action of erythrocites on, 697
trypanocidal titre of rabbits' serum after injections, 26, 698
arsenopyridin compounds, tests on rodents, 29, 704
Bayer 205 (Germanin, *see also* moranyl) in *rhodesiense* infection, 21
infectivity to tsetse of *T. rhodesiense* in relapses after treatment, 30, 363
opsonic action, 23, 359, 702
resistance, 703, 704
Bayer 205 and tryparsamide, 683
Br. 23, tests, 29, 705
combined therapy, 24, 695
in Belgian Congo, 683
drug-resistance, 15, 17, 18, 358, 359, 684, 687, 695, 703, 704, 708
dyes, mechanism of action, 355
K. 324 and K. 352, tests on rodents, 699
moranyl (Fourneau 309, *see also* Bayer 205), blood coagulation in plasma treated with, 355
dosage in *gambiense* infection, 21
novarsenobillon, trypanocidal titre of rabbits' serum after injection, 26, 698
orsanine, tests on rodents, 354
pyrrol dyes, tests on rodents, 702
quinine iodo-bismuthate in experimental *gambiense* infection, 20
salvarsan and heavy metals, combined therapy, 24
sodium hyposulphite, in ocular troubles, 19, 683

Trypanosomiasis—*cont.*
human—*cont.*
African (sleeping sickness—*cont.*).
treatment (incl'g experimental)—*cont.*
Sdt. 386B, tests, 29, 687
surfen C, tests in Nigeria, 686
tartar emetic spray, inhalation of, tests on rodents, 698
triphenylmethane dyes and acriflavine, antagonistic action, 707
trypanocidal drugs, article on, 385, 390
tryparsamide (tryponarsyl, tryparsone)
cerebrospinal fluid changes in treated patients, 694
compared with orsanine, 354
diffusibility into erythrocites, 697
effect on blood and gland infections, 16, 687
resistance, 15, 17, 18, 358, 359, 684, 687, 695
in 2nd stage of disease, 17, 18, 355
test of toxicity, 696
trypanocidal titre of rabbits' serum after injection, 26, 698
tryparsamide and Bayer 205, 683
tryparsamide and styryl-245 combined action, 706
tryparsamide and urotropine in 2nd and 3rd stages, 19, 355
tryponurile, 355, 695
urotropine with tryparsamide, 19, 355
and tuberculosis, 349
American (Chagas' Disease) *see also Trypanosoma cruzi*
in Argentine, 36, 37, 717, 720, 721
Brazil, 364, 365, 366
Guatemala, 718
Panama, 363, 512
Venezuela, 38
armadillo, ulceration in naturally infected, 366
bat, as possible host, 717
cat as host, 37
diagnosis, Brumpt's xenodiagnostic method, 365
dog as host, 37, 719
" cystic gigantocytes " in experimentally infected, 38
ulceration in experimentally infected, 366
duration of infection in man, 363
experimental infection of man, 37, 364, 721
passage of *T. cruzi* through conjunctiva, 364
virulence of *T. cruzi* attenuated by human passage, 37
and goitre, 720
monkeys from Java, as hosts, 718
reduviid bugs naturally infected,
in Argentine, 717
California, 364, 365
Guatemala, 719
Panama, 38
Venezuela, 38
Trypanosomiasis—*cont.*
human—*cont.*
American (Chagas' Disease)—*cont.*
symptoms, oedema of eyelid, 717
titles of unnoticed papers, 43, 371
transmission experiments with *Ornithodorus*, 38
wood-rats as natural hosts in California, 364
immunity, active and passive, of rodents, 715
to re-infection, of guineapigs, after moranyl treatment, 713
prophylactic action, of Bayer 205, in rodents, 28, 363
of copper and iron, 42, 362
of styryl compounds, 28
rats, chemotherapy of *T. lewisi* infection in, 708
spleen weight and body weight, relationship in normal and infected rats, 712
splenectomy, influence on infection in rodents, 30, 42
Trypanosomidae, influence of bacteria and fungi on cultivation of, 223
Tsetse fly, *see also Glossina*
climate and, laboratory studies on, 369, 723
control, by bush clearing, 39
protection against grass fires in, 369
East Africa Sub-Committee, report, 677
investigations and surveys
Gold Coast, 40
Kenya Masai Reserve, 367
Nigeria, 41, 685, 723
Nyasaland, 909
Tanganyika Territory, 367, 368, 369
Uganda, 674
program of research, 13
Tsutsugamushi disease, *see under* Typhus group of fevers
Tuberculosis
in Netherlands Indies (book review), 917
exacerbation of lesions by bismuth, 893
experimental, Henry's reaction in, 132
and nervous trypanosomiasis, 349
pulmonary, and malaria, 70
" Two-weeks fever " of Formosa, *see under* Typhus group of fevers
TYPHUS GROUP OF FEVERS, 153–170, 556–583
boutonneuse fever
in Sicily, 575
Tripolitania, 575
conjunctival onset, 168
encephalitis in, 576
and infantile kala azar associated, 480
nomenclature, 168
transmission experiments with *Rhipicephalus sanguineus* in Sicily, 575
treatment by horse serum, 575
Brill's disease and classical typhus, 154, 159, 563
classification, by serological reactions, 556
by vector, 153
Colorado tick fever, 517
cross-immunity tests, 156, 158, 577, 580, 581, 582

Typhus Group of Fevers—*cont.*
Cyrenaica, typhus group of fevers seen in, 561
diagnosis by guineapig inoculation, 566
endemic typhus,
in Alabama, 564
Cochin-China, 157, 562
Istanbul, 562
S. Paulo, *see under* São Paulo typhus *below*
Union of South Africa, 561
and epidemic, 153
iridocyclitis produced by virus, 566
knee jerks in, 564
pulmonary symptoms in, 157
and Rocky Mountain fever, differentiation, 167
woodchucks (marmots) and mice, susceptibility of, 160
epidemic typhus
in Algiers, Géryville, 902
Egypt, 556
Morocco, 570
Tunis, 558
Uganda, 156
Union of South Africa, 561
and endemic, 153
inapparent form, in nomads in Tunis, 558, 559
and murine, in Tunis, 558
orchitis produced by Tunis strain, 160
vaccination against with living vaccine in Morocco, 163, 570
in Formosa, " two-weeks fever " or sporadic eruptive fever, 166
Henry's reaction in, 421, 792
inapparent, in cat, 565
experimental control, during epidemic, 559
Indian typhus, vector unknown, 153, 572, 573
infections *via* digestive tract, 161
lice, method of infection by, 571
" Manchurian fever " in Manchukuo, 563
in Minas Geraes, Brazil, 157
murine typhus,
and epidemic, 558
laboratory infection of man, 560
in relation to historic typhus in Tunis, 558, 559
virus, absent from Athens mice, 565
adapted to field mice and pigeons, 160
in Leningrad rats, 565
in Moscow rats, 158
neurotropism, 160
maintenance, 568
in Saigon rats, 157
in Tunis port rats, 158, 558
Weil-Felix reaction in Hamburg rats, 163
pigs, a rickettsiasis from ticks from, 579
Proteus agglutination in guineapigs, 164
Proteus americanus OXA, agglutination reactions, 166
Proteus S24, antigenic characters, 164
Proteus XK, infections with, 165
Proteus XL, agglutination reactions, 165
radiation in, effect of short wave therapy, in guineapigs, 568
reticulo-endothelial system in, 161

Typhus Group of Fevers—*cont.*
Rickettsia, *see also* virus
cultivation,
inhibiting action of immune tissue, 162
on membrane of chick embryo, 162, 582
preservation in cultures, 569
filterability, 161
microscopic appearances, 161
Rocky Mountain fever
in N. Carolina, 167
cross-immunity between São Paulo typhus and, 580, 581, 582
differentiation from endemic typhus, 167
reaction of rabbits to S. Paulo and Rocky Mt. fever virus compared, 581
susceptibility of mice, 565
tick vectors, 517
Weil-Felix reaction, 581
São Paulo typhus
compared with typhus of Chile, 159
cross-immunity between Rocky Mt. fever and, 580, 581, 582
culture of Rickettsia on membranes of chick embryo, 582
reaction of rabbits to Rocky Mt. fever and S. Paulo virus compared, 581
transmission experiments, with *Cimex lectularius*, 580
Weil-Felix reaction, 581
scrotal reactions, in guineapigs inoculated with virus, 560
of rat-bite fever and typhus compared, 600
serology of animals inoculated with Pekin strain of virus, 567
serum, protective, in, 564
Sumatran mite fever,
differentiation from tsutsugamushi disease, 579, 580
experimental, in guineapigs, 578
in monkeys, 580
in white mice, 579
tick bite fever
in South Africa, 154, 168, 561
agglutination tests, 155
ticks from wild pigs, rickettsiasis from, 579
titles of unnoticed papers, 170, 582
transmission
by lice, 571
ticks, 574, 575
treatment, by whole-blood from convalescents, 564
tropical typhus
in Dutch East Indies, 576
Federated Malay States, 577
Kenya, 574
cross-immunity between tsutsugamushi disease and, 577
diagnosis by Marris atropine test, 577
" rural " type in relation to tsutsugamushi disease in F.M.S., 577
" shop " type in Chinese in Dutch East Indies, 576
with primary lesion, 169
transmission by *Rhipicephalus sanguineus* in Kenya, 574

Typhus Group of Fevers—*cont.*
of the tropics, 153
tsutsugamushi disease
in Federated Malay States, 577
cross-immunity between tropical "rural" typhus and, 577
differentiation from Sumatran mite fever, 579, 580
iridocyclitis produced by virus, 566
studies on, 169
transmission, experiments with lice and fleas, 578
virus experiments, 578
survival in *X. cheopis*, 578
Weil-Felix reaction in, 578
"two-weeks fever" of Formosa, 166
Union of South Africa, typhus-like fevers in, 154, 561
vaccination, of guineapigs, with formalized Rickettsia culture, 163, 571
of man, with living attenuated virus, 163, 570
verruga peruana, a typhus-like disease, 583
virus, attenuation by ageing, 571
of Brill's disease compared with European virus, 159
cultivation, 569
of Manchurian virus, 162
in dogs in Messina, 576
human, in Mongolia, 567
human and rat, in Tunis, 558, 559
maintenance in rabbits by intraocular inoculation, 577
not conveyed to rats ingesting infected lice, 557
not modified by change of vector, 531, 568
Rickettsia cells in mice infected with, 566
scrotal reactions produced by, 560
susceptibility of mice to, 565, 566
survival in mouse passage, 159
Weil-Felix reaction, 163, 164, 562, 569, 578, 581
Tyroglyphus longior, intestinal acariasis due to, 671
Ulcers, chronic, treatment by sympathectomy, 508
tropical
in African natives, 519
Fiji, 519
India, Naga sore on tea estates, 216
site of, 519
treatment
Dickson-Wright's method, 519
dietetic, 519
ointment, 520
tinfoil bandage, 520
zipp, 519
zincera, 519
Undulant fever, differential diagnosis from malaria, 406
Vangueria edulis decoction (Edulin) as anthelmintic, 622
Vectors, influence on biological properties of microbes, 531
Venom of *Atrox robustus*, 672
of *Scolopendra cingulata*, 672
Venoms, snake, *see under* Snakes, venomous and snake venoms
Verruga peruana, action of Std. 386 B or Bartonella infection, 227
a typhus-like disease, 583
treatment with salvarsan, 584
Village sanitation in Egypt, 506
Vitamin B_1 deficiency, effect on incubation period of rat leprosy, 863
Vitamin B_2 (G) deficiency as factor in etiology of leprosy, 335
Wassermann reaction in leprosy, 339, 547, 867
in malaria, 794
Weil's disease
after rat bite, 602
treatment, bismuth compounds, 600
immune serum, 600, 601
Wohlfahrtia vigil, myiasis due to, in Montreal, 665
Wuchereria bancrofti, *see under Filaria*.
Xanthochromia and intestinal parasites, 233
Xenopsylla brasiliensis, plague vectors in Uganda, 674, 845
cheopis, biology in Madagascar, 846
index in Buenos Aires, 447
in Hawaiian Islands, 446
hawaiiensis and rural plague in Hawaiian Islands, 446
YAWS AND SYPHILIS, 50–59, 883–894
Yaws
in Assam, 55
Costa Rica, 889
French Cameroon, 54
Gold Coast, among Konkomba tribe, 52
Haiti, 53
Jamaica, 50, 883, 887, 889
New Hebrides, 891
Nigeria, Adamawa Reserve, 52
Panama, 53, 894
Ruanda-Urundi, 892
Sudan, 53
Sumatra, 56
aetiology, 52
and boomerang leg, 891
cerebrospinal fluid in, 54
control by treatment in Jamaica, 887
gangosa and, 51, 56
goundou and, 51
in guineapigs, comparison with experimental syphilis, 57
immunity and, 884
and interstitial ketatitis, 891
juxta-articular nodules and, 51
lesions, atypical, in Panama, 53
of bone, tertiary, 55
initial, 889
of mucous membranes, 53
multiple, 889
of testis, 50
in rabbits, comparison with experimental syphilis, 57
and rheumatism in Ruanda-Urundi, 892
rhinopharyngitis mutilans due to, 56
and syphilis, relationship, 57, 884, 890
titles of unnoticed papers, 59, 894
transmission, by *Hippelates*, 884, 886
by non-biting haematophagous flies, 68
treatment, 55
bismuth, 55
bismuth, salicylate, 883

aws—*cont.*
treatment—*cont.*
bisuprol, 56
" casbis," 55
copper sulphate, intravenously, 56
neoarsphenamine, 883
neosalvarsan, 55
thio-bismol, death following, 893
sodium vanadium tartrate (tarvan), 894
ekiri, *see* Dysentery, bacillary
ELLOW FEVER, 280–295, 585–595, 874–882
ellow Fever,
in Africa :
Angola, 281, 282
Belgian Congo, 281, 282
British West Africa, 281, 295, 874, 875
Cameroon, 282
French Equatorial Africa, 281, 282, 875
French West Africa, 284, 285, 874, 875, 877
Ivory Coast, 874, 875, 877
Sierra Leone, 295
Sudan, Anglo-Egyptian, 281, 284, 875
French, 589
in America :
Argentine, 587
Brazil, 281, 585, 874, 876
Colombia, 589, 874, 878
San Domingo Expedition (1902), 69
Vera Cruz garrison (1861–1867), 875
Aëdes aegypti, biology of, 134, 292, 593, 594, 912
incubation period in, 592
scapularis, possible carrier, 586
cerebrospinal fluid of *M. rhesus* in, 292
control in Argentine, 587
in Brazil, 585
epidemiology, possible spread to Asia, 283, 590
hedgehog, susceptibility of, 280, 290, 291
hemiplegia in, 284
immunity
in rabbits, 879
of Sudanese battalion in Vera Cruz (1863–67), 875
inapparent infection, a stage in extinction, 284
inclusion bodies in, 293
in recovered guineapigs infected subdurally, 879
monkeys, positive protection tests in, 878
optic neuritis in, 284
protection tests
in Africa, 280, 281, 875
Angola, 281, 282
Belgian Congo, 281, 282
British West Africa, 281
French African Colonies, 878
French Cameroon, 282
Yellow Fever—*cont.*
protection tests—*cont.*
in French Equatorial Africa, 282, 874, 881
Sudan, A. E., 281, 875
in America,
Brazil, 586
Colombia, 589, 878
in Cubans born since 1901, 283
specificity of, 877
positive against " red fever " of the Congo, 875, 881
use of guineapigs in, 289
in rabbit, inoculation of virus and antibody response, 879
" rural " and " jungle " outbreaks in Brazil, 280, 585, 586, 874, 876
in Colombia, 878
titles of unnoticed papers, 295, 595, 882
transmission
in absence of *Aëdes aegypti*, 586, 878
by dog fleas, negative experiment, 294
of neurotropic virus, 288, 289
by *Stomoxys calcitrans*, positive experiment, 294
vaccination,
living dried virus coated with egg yolk, 880
neurotropic virus (Laigret's method), 284, 285, 287, 288, 289, 586, 876, 879, 880
neurotropic virus and immune serum, 286, 586, 875, 880
virus
in *A. aegypti*, incubation period, 592
French strain, protective action of serum of patient furnishing, 284
in mice, effects of extra-neural injection, 591
in monkeys, content and protective antibodies, 590
purification by adsorption and elution, 293
in rabbit, development of antibodies, 879
ultrafiltration studies, 593
neurotropic
action on guineapigs and monkeys, 288, 593
encephalomyelitis produced by, 593
inoculation into pig, 290
instillation into nares and conjunctiva of monkey, 289
passage through Seitz filters, 880
reconversion into viscerotropic strain in *rhesus*, 590
susceptibility of hedgehog, 290, 291
viscerotropic
inoculation into *M. rhesus*, 292
susceptibility of hedgehogs, 291
viscerotomy services, 586, 589

Printed under the authority of His Majesty's Stationery Office
by the South Essex Recorders, Ltd., High Road, Ilford.

(230) Wt. P829/173 1875 7/36 S.E.R. Ltd Gp. 353.